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CUBA NUMBER

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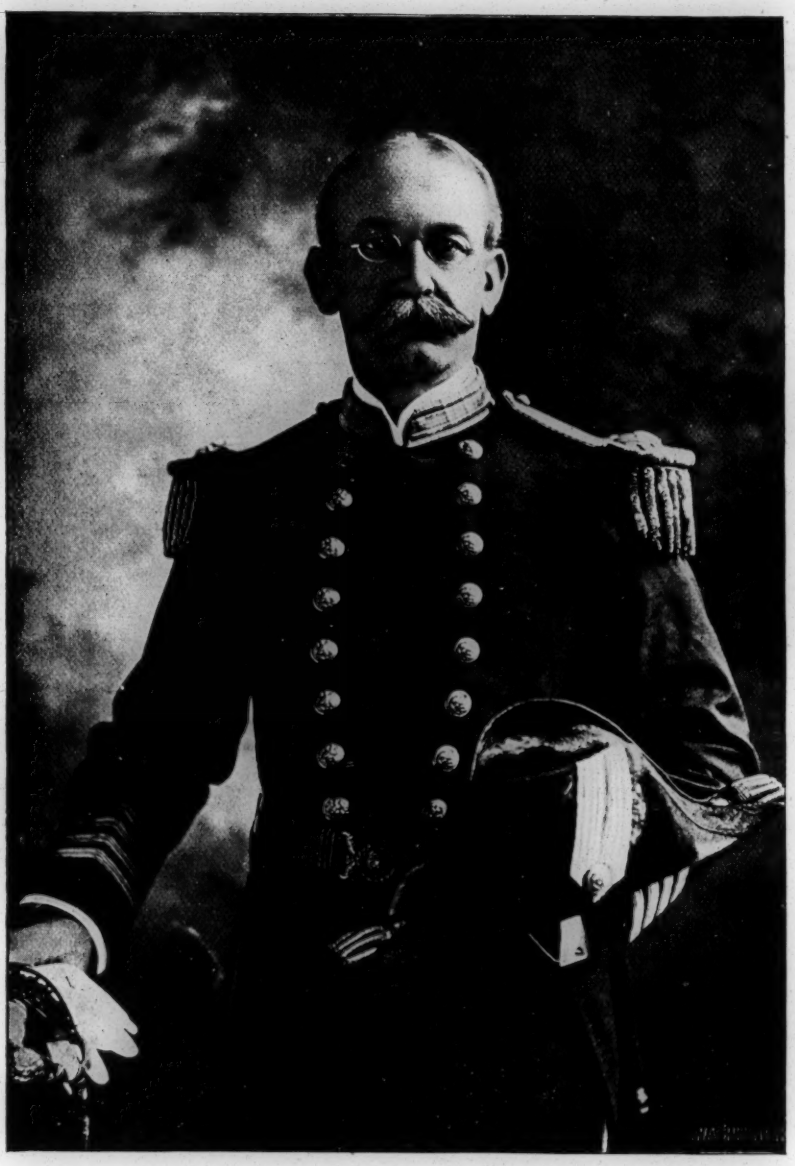
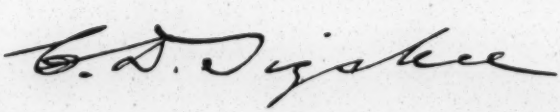




CAPTAIN U. S. NAVY

THE

National Geographic Magazine

VOL. IX MAY, 1898 No. 5

CUBA

By ROBERT T. HILL,

United States Geological Survey

SITUATION AND GEOGRAPHIC RELATIONS

Cuba is the westernmost and largest of the four islands known as the Great Antilles. These, with the Virgin islands at their eastern end, stretch east and west for over 1,350 miles, and constitute a distinct geographic province—distinct in relief, geologic formation, and history from the other West India islands and the adjacent mainlands.

In their climate and vegetation, as in their topographic features or geologic history, the Antilles have no affinities with conditions with which we are familiar in the United States. Their whole aspect is tropical, yet they possess so many unique individual features, differing from those of other tropical lands, that they belong in a class entirely by themselves. The causes of this individuality are involved in a peculiar geologic history, which can be dwelt upon here only to the extent of stating that it has produced certain peculiarities of configuration and given origin to formations which weather into soils of unusual productiveness.

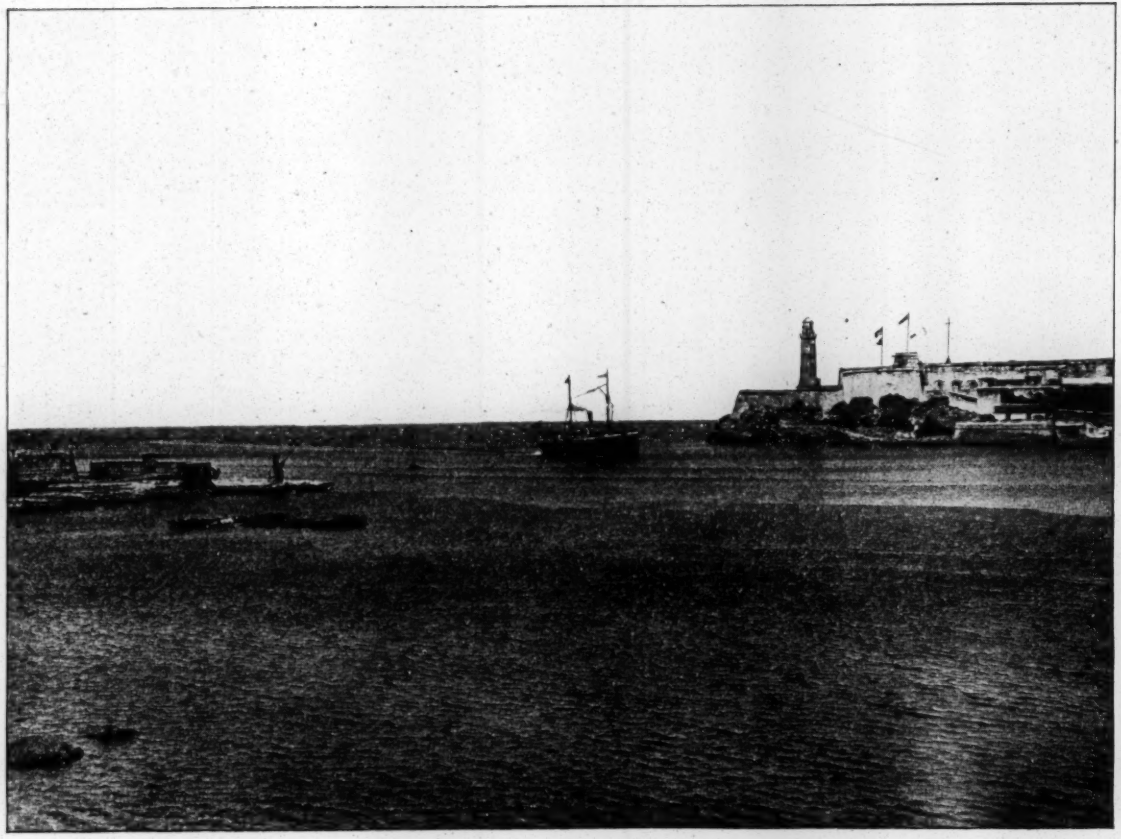
Collectively the Great Antilles consist of a disconnected chain of mountains (the Antillean system) protruding above the sea and having an east-west trend directly transverse to that of the axial continental Cordilleras. The highest peaks of this system in Haiti, Cuba, and Jamaica are 11,000, 9,000, and 7,000 feet respectively. These mountains of deformation are irregularly

flanked below 2,000 feet by horizontal benches or terraces, which are the result of regional elevations and base-leveling after the last period of mountain-making in Miocene time. The Antillean uplift may be compared to an inverted, elongated canoe, the highest and central part of which is in the region adjacent to the Windward passage. Thus it is that the higher peaks occur in Haiti, eastern Cuba, and eastern Jamaica, while the arching crest line descends toward the western part of the two latter islands and, on the east, toward Porto Rico. The higher mountains are composed of non-calcareous clay conglomerate and igneous rock, the debris of unknown lands of pre-Tertiary time, which, with the exception of a few restricted points, were buried, during a profound subsidence in early Tertiary time, beneath a vast accumulation of calcareous oceanic sediments now composing the white limestones which constitute the chief formations of the islands, and which were, together with the preceding formations, elevated into their present position at the close of the Tertiary period.* The mountains above 2,000 feet are composed of the older non-calcareous formations and the bordering plateaus of limestone, resulting in two distinct and contrasting types of soil throughout the Antilles.

STRATEGIC AND COMMERCIAL POSITION

In area, in natural resources, in the number and character of its inhabitants, in position as regards proximity to the American and Mexican seaboards, strategically Cuba is by far the most important of the Great Antilles. It is very near the center of the great American Mediterranean, separating the Gulf of Mexico from the Caribbean sea, and in close proximity to our southern

*The general geology of the island, while not discussed in this article, is well shown in many of the illustrations. It may be briefly stated as consisting of an older basement of pre-Tertiary sedimentary rocks, in which Cretaceous and probably Jurassic fossils have been found. Above this there are, first, littoral beds composed of terrigenous material, and then a great thickness of white limestones consisting of organically derived oceanic material, as distinguished from true reef rock of late Eocene and Oligocene age. The island was reclaimed from the sea and assumed its present relief by a great mountain-making movement in late Tertiary time, succeeding the deposition of these limestones. In later epochs, Pliocene and Pleistocene, the island underwent a series of epeirogenic subsidences and elevations which affected the coastal borders, producing the wave-cut cliffs and a margin of elevated reef rock which borders the coast in many places, as can be recognized in the illustrations of the cities of Habana and Baracoa. So far as its history is known, the island has never been connected with the American mainland, although such has frequently been asserted to be the case. These assertions have been based upoh the erroneous identification of certain vertebrate animal remains. There are no traces in the animal life of Cuba, past or present, which justify this conclusion. Some of the crystalline rocks may be ancient, but most of them are mid-Tertiary in age.



ENTRANCE TO HABANA HARBOR, LOOKING OUTWARD

A shore battery on the left *Morro Castle on the right*

seaboard, the coast of Mexico, the Bahamas, Haiti, Jamaica, Central America, the Isthmus, and the coast of South America.

The island commands three important maritime gateways: the Straits of Florida, leading from the Atlantic ocean into the Gulf of Mexico; the Windward passage, leading from the Atlantic into the Caribbean sea, and the Yucatan channel, connecting the Caribbean sea and the Gulf. The first and last of these completely command the Gulf of Mexico. It is less than 96½ miles from Key West to the north coast of Cuba. From the east end of the island, Haiti and Jamaica are visible, 54 and 85 miles distant respectively. From the western cape (San Antonio) to Yucatan the distance is 130 miles.

OUTLINE, DIMENSIONS, AND AREA

The outline of the island, commonly compared by the Spaniards to that of a bird's tongue, also resembles a great, hammer-headed shark, the head of which forms the straight, south coast of the east end of the island, while the body extends to the westward in a sinuous curve. This analogy is made still more striking by two long, fin-like strings of cays or islets, which extend backward along the opposite coasts, parallel to the main body of the island.

The longer axis of the island extends from the 74th to the 85th meridian, while its latitude, between 19° 40′ and 23° 33′, embraces nearly four degrees. Its length, following an axial line drawn through its center from Cape Mayci to Cape San Antonio, is 730 miles. Its width varies from 90 miles in the east to less than 20 miles in the longitude of Habana. Cape Mayci, on the east, lies directly south of New York, while Cape San Antonio is situated south of Cincinnati.

At the outset the reader should dispossess his mind of any preconceived idea that the island of Cuba is in any sense a physical unit. On the contrary, it presents a diversity of topographic, climatic, and cultural features which, as distributed, divide the island into at least three distinct natural provinces, which for convenience may be termed the Eastern, Central, and Western.

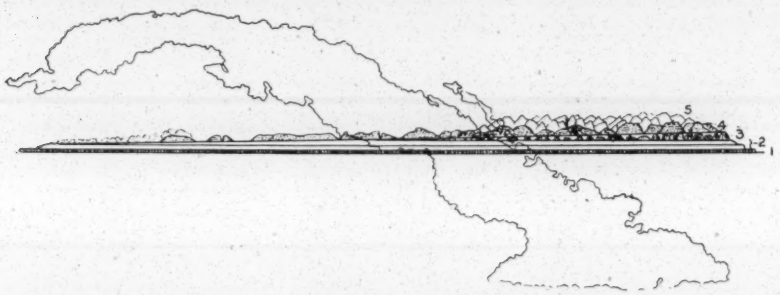
No accurate trigonometric surveys have been made of the island and its bordering islets, including 570 cays adjacent to the north coast and 730 to the south, or of the Isle of Pines, a large and important dependency. Nearly all existing geographic data have been based upon a large map compiled by Pichardo,

engraved in Barcelona, which was a compilation of local surveys of various and doubtful degrees of accuracy.

The area of the main island has been estimated at from 40,000 to 43,000 square miles, that of the Isle of Pines at 1,214, and that of the cays at 1,350. Some of the larger cays, like Romano, are 140 square miles in extent. Reclus estimates the total at 45,883 square miles, an area about equal to that of the state of New York and nearly one-fourth the size of Spain.

CONFIGURATION

The distinct types of relief include regions of high mountains, low hills, dissected plateaus, level plains, intermontane valleys, and coastal swamps. In general, however, with the exception of a strip of the south-central coast, the island as a whole stands

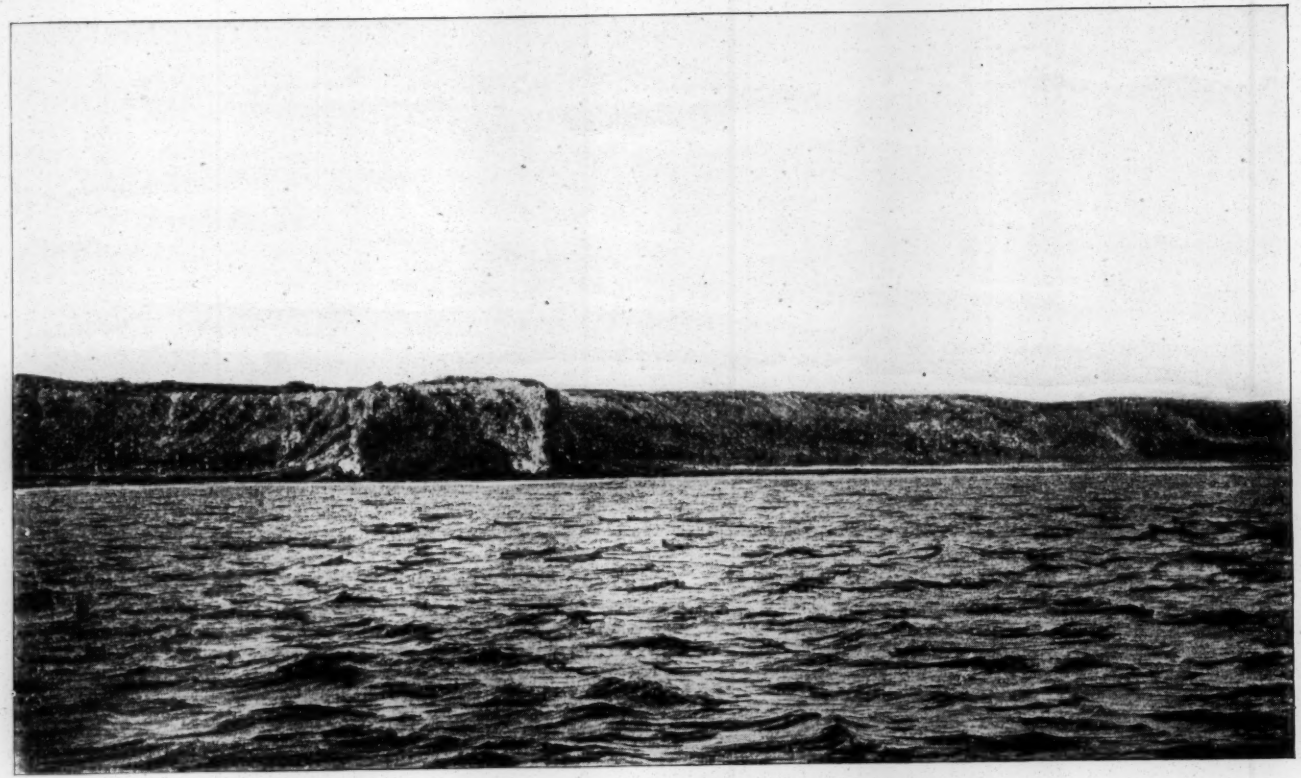


CONFIGURATION.—1. Bench of elevated coral reef. 2. Later terraces bordering the island. 3. Cuchilla terraces. 4. Older and higher levels. 5. Mountains of deformation.

well above the sea, is thoroughly drained, and presents a rugged aspect when viewed from the sea. About one-fourth of the total area is mountainous, three-fifths are rolling plain, valleys, and gentle arable slopes, and the re nainder is swampy.

THE COAST

The coast line of Cuba is very extensive, measuring, without its meanderings, nearly 2,200 miles. On Pichardo's map the coast line, measured with all its embayments and including the islets, is over 6,800 miles. On all sides except the south-central the coast is abrupt, except where indented by pouch-like harbors, and stands above the sea as if the waters of the latter were rapidly planing away what had once been a more extensive land. In many places the immediate coast line is a narrow bench of elevated reef rock a few yards in width and



ELEVATED NORTH COAST OF CUBA, BETWEEN HABANA AND MATANZAS, NEAR CANAISI RIVER

standing about 20 feet above the sea, between the bluffs and the water. The coast border on the north presents a low cliff topography, with a horizontal sky line from Matanzas westward, gradually decreasing from 500 feet at Matanzas to 100 feet in the west. The coast of the east end is abrupt and rugged, presenting both on the north and south sides a series of remarkable terraces, representing successive pauses or stages in the elevation of the island above the sea, and constituting one of the most striking features anywhere to be seen. West of Guantanamo to Cape Cruz the precipitous Sierra Maestra rises immediately back of these terraces. From Cape Cruz to Cape San Antonio, with the exception of a brief stretch between Trinidad and Cienfuegos, the coast is generally low and marshy.

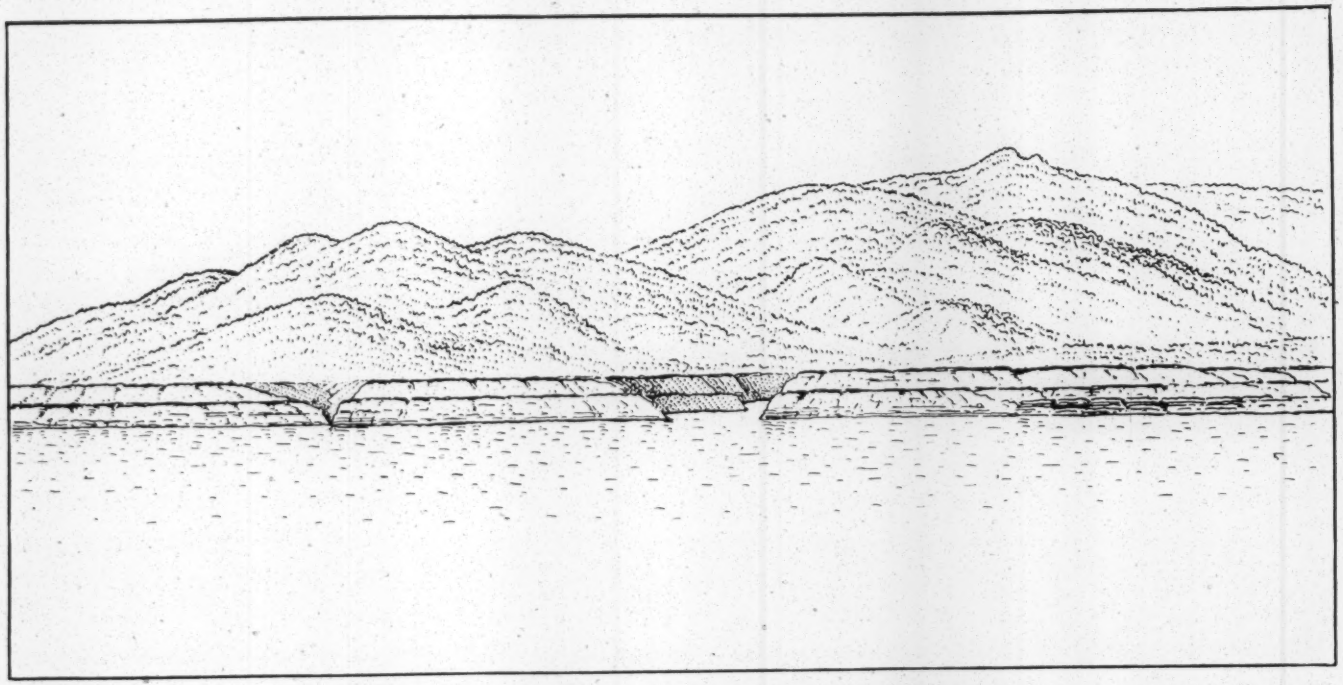
The cays adjacent to the middle third of the island, on both the north and south sides (the famous Jardines of Columbus), are mostly small coral or mangrove islets which have grown up from shallow, submerged platforms surrounding those parts of the island and in places form barriers to the mainland. They are mainly uninhabited, owing to the scarcity of potable waters, but constitute a formidable obstacle to navigation, except when guided by skillful pilotage.

THE INTERIOR

The interior of the island of Cuba has not been sufficiently surveyed to accurately map the nature of the soil or the relief of the surface. The various commissions named in times past by the Captains General to make reconnaissances avow in their reports that the lack of habitation in the greater part of the territory, the impenetrability of the forests, the insurmountable Cordilleras, and the scarcity of means and time have prevented them from carrying out successfully the mapping of the diverse ramifications of the mountains, the tracing out of their salients and valleys, and the determination of their extent, altitude, and geologic structure. It seems that their observations did not extend east of the 70th meridian, where the most interesting part of the island, from a scientific point of view, is found. Furthermore, the results of such investigations as were made were but imperfectly published in fragments.

MOUNTAINS

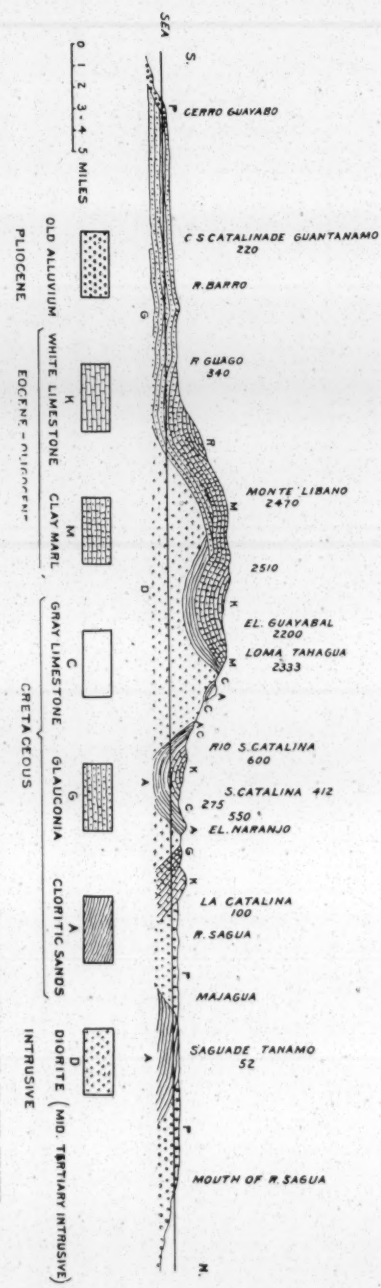
The higher eminences are true mountains of deformation, composed of disturbed sedimentary rocks with igneous intru-



COAST TOPOGRAPHY, EAST OF SANTIAGO DE CUBA, SHOWING MOUNTAINS AND ELEVATED TERRACES

From a Sketch by Prof. A. Agassiz

sions. The mountains of this class do not constitute a continuous axial backbone to the island, as popularly supposed, but occur in three distinct and independent groups, known as the eastern, western, and central, respectively, the trends of which overlap each other *en echelon*. The highest of these is the narrow, precipitous, eastern range, known as the Sierra Maestra, which dominates the straight east-and-west coast of Santiago de Cuba and culminates in the Pico del Turquino, which rises directly from the sea to a height variously estimated at from 8,600 to 9,000 feet. La Gran Piedra, in this range, near Santiago, is 5,200 feet high. This master range extends through 2½ degrees of longitude, from Guantanamo to Cape Cruz, and constitutes an independent feature topographically different from the rest of Cuba. Geographically it belongs to a class with the Blue mountains of Jamaica and the higher summits of Haiti, collectively constituting the master ranges of the Great Antilles, which have been thrown up directly at right angles to the trends of the continental Cordilleras and at a far more recent period of time. These mountains are composed of non-calcareous conglomerates and shales of Mesozoic and

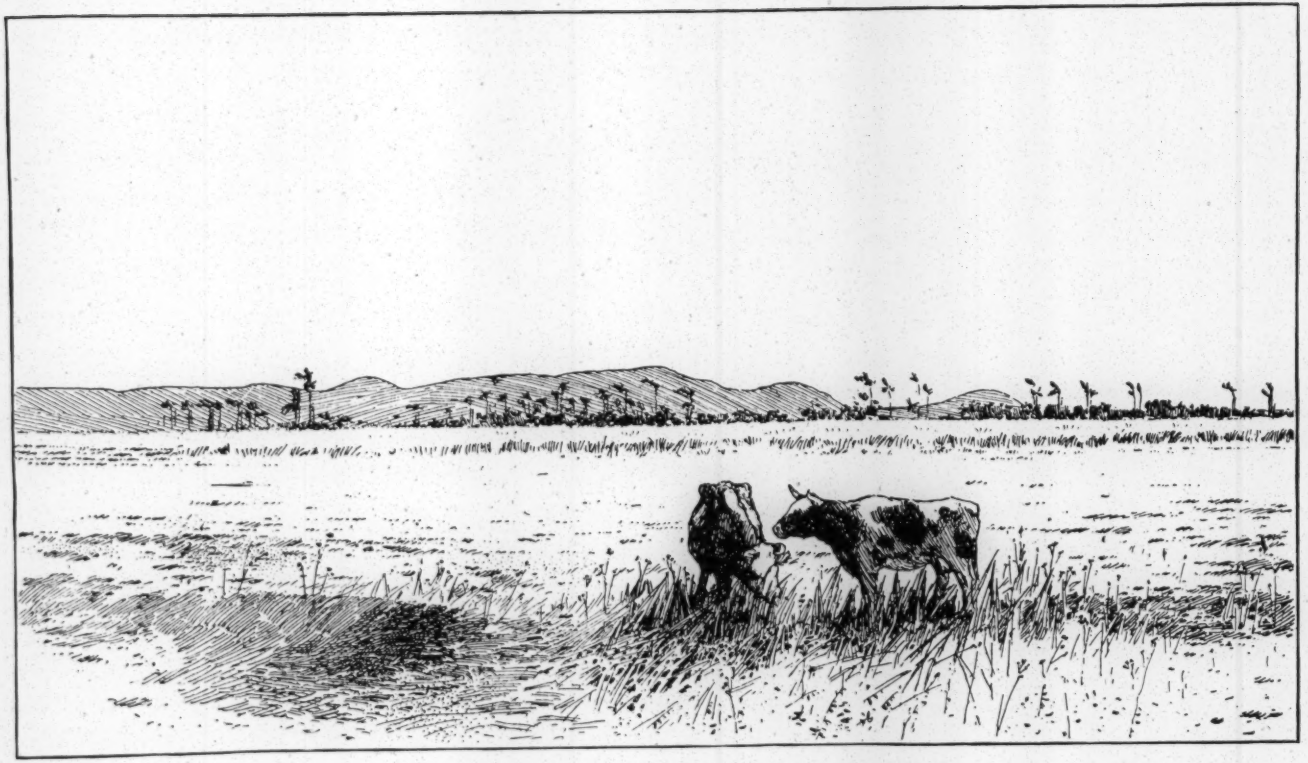


GEOLOGIC SECTION BY V. PELLITERO ACROSS EAST END OF CUBA — SECTION E-F OF GEOLOGIC MAP — THE AGE NAMES ARE ADDED BY THE WRITER

Eocene age, intruded by ancient mid-Tertiary igneous rocks, the debris of which makes a clay and gravel soil—one of the two contrasting types which constitute the greatest wealth of the island.

The Sierra Maestra crest closely parallels the adjacent sea coast, toward which its slopes descend precipitously. Inland, toward the north, the slope is gentler, the eroded ridges leading gradually down to the valley of the Cauto, the deep indentation of which nearly separates these mountains from the region to the north. The second group of mountains, the Sierra de los Organos, is found in the extreme western province of Pinar del Rio, extending northeast and southwest between Mariel, near Habana, and Cape San Antonio. This range consists of lower ridges of geologic formation different from those of the Sierra Maestra. Its summits culminate in the Pan de Guajaibon, west of Habana, which has an altitude of 2,532 feet. Its rocks are composed of deformed sedimentaries of supposed Paleozoic, Triassic, Jurassic, and Tertiary age, the uplift of which may have been cumulative, but culminated during the close of the last-mentioned period. The Organos are covered with a growth of pine and flanked on either side by many beautiful slopes and valleys, those on the south constituting the famous Vuelta Abajo tobacco lands.

While the Sierra Organos proper cease just west of Habana, the strike of their uplift, accompanied by the same character of igneous protrusions flanked by Tertiary limestones, although void of the older rocks, is traceable by a series of low disconnected hills, in a gently curved line passing throughout the central plain of the island and to the north of the third or central group of Trinidad into the western part of the province of Puerto Principe. Thus, in a manner, this line of uplift, varying in intensity from the sharp ridges of the west to low flattened folds in the middle provinces, constitutes the nearest resemblance to an axial backbone of the body of the sinuous outline of the island, while the Sierra Maestra constitutes the head. The principal components of these interrupted summits of low relief dotting the plains of Habana, Matanzas, Santa Clara, and Puerto Principe are as follows: Almost due south of Habana, commencing east of the village of Santiago, is a range of low, timbered hills, surrounded by plains, including the Tetas de Managua, the Arcas de Canasi, Lomas de Camoa, the Escallera de Jaruco (which is visible from a great distance), and the Pan de Matanzas. Along the north coast between Habana and Matanzas there are many



MOUNTAINS RISING OUT OF CENTRAL PLAIN, SOUTH OF MATANZAS

of these hills, which, as remarked by Humboldt, afford some of the most beautiful scenic prospects in the world. The occurrence of these lower timbered summits in a region which is generally level plain has afforded a safe retreat for bands of insurgents, who make them a base for frequent incursions upon the outskirts of Habana and Matanzas.

For a brief interval these hills die out in eastern Matanzas, but upon crossing into Santa Clara, and from thence on into Santiago de Cuba, they reappear as long crest lines and flat-topped plateaus, following a line near and parallel with the north coast, including the Sierras Zatibonico and Cubitas. The last-named ridge has been an impregnable insurgent stronghold during the present revolution and was for a time the seat of the insurgent government.

The third group of high mountains occupies a limited area between Cienfuegos and Santo Espiritu, on the south side of the central portion of the island, and to the northward of the city of Trinidad, and entirely south of the axial group above described. These are less angular than the eminences of the Sierra Maestra and consist of central summits with radiating slopes, the highest of which is El Potrerillo, 2 900 feet. They are composed of semi-crystalline limestones and shales which have been doubtfully considered of Paleozoic origin, flanked by highly disturbed Cretaceous and Tertiary beds. Interspersed between these mountains are numerous fertile valleys, giving to this part of Cuba a diversified landscape.

THE LIMESTONE PLAINS

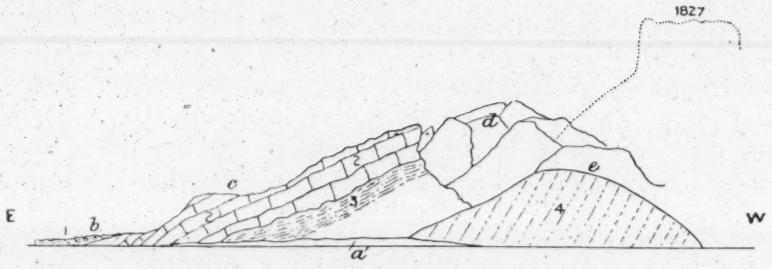
The three dominant groups of mountains above described are topographic irregularities surviving from earlier epochs or pushed up with the great sheets of Tertiary limestone which in all the intermediate and coastal areas comprise the dominant formation of the island. This limestone crust, gently warped and undulated in many directions, has great variation in altitude. Its maximum elevation is in the extreme east, and gradually decreases to the center of the island, rising again to the west. In the eastern and northern parts of the province of Santiago de Cuba it constitutes an elevated plateau, attaining a height of nearly 1,800 feet and embeds the base of the Sierra Maestra. Here it is so dissected by drainage that it gives a most rugged relief to the district which it occupies, and presents on the seaward side a remarkable series of terraced cliffs, repre-

senting successive elevations of the island in Pliocene, Pleistocene, and recent time. This topography is surmounted by extensive flat-topped summits like the Mesa Toar and the Junki (anvil) of Baracoa (alt. 1,827 feet), bordered by numerous sharp, knife-edged salients, known as cuchillas. Similar remnantal flat tops occur at rare intervals as far west as Matanzas, the most conspicuous of which are the Sierra Matahambre and the Pan de Matanzas (alt. 1,200 feet). To the westward, in the provinces of Matanzas and Habana, the arch of the plateau, which follows the northern side, descends nearer and nearer sea-level, and develops a longer but gentle slope toward the south coast, hence presenting a cliff topography to the north sea and gradually merging, as the great central plain of Cuba, into the Caribbean, producing the extensive cienega or swamp known as the Zapata on the coast opposite Matanzas.

Through Puerto Principe and Santa Clara, except where broken by the central mountains of Trinidad, this limestone stretch forms two wide coastal belts, each about a third the width of the island, separated by a central axial strip. West of Santa Clara these two belts unite into the broad plains of Matanzas and Habana, where they constitute the central sugar region of Cuba—the Vuelta Arriba—and again diverge west of the latter city along either side of the central mountains of Pinar del Rio, where it constitutes the Vuelta Abajo. These limestone districts weather into fertile calcareous soils, red and black in color, and of a quality and depth unequaled in the world, and their extent in the level region is an almost continuous field of sugar-cane. At two places throughout the length of the island there are depressions crossing it where the divide is reduced to less than 500 feet. The first of these is between Moron and the south coast, in Puerto Principe, and the second between Habana and Batabano.

GEOLOGIC SECTION ACROSS THE CENTRAL LIMESTONE PLAINS FROM HABANA TO BATABANO

1. Guanabacon formation, Eocene clays intruded by Miocene igneous rocks. 2. Vicksburg limestones and Bowden marl. 3. Elevated reef rock. 4. Zapata swamp formation



SECTION AT BARACOA

1. Elevated reef
2, 3. Bowden Oligocene
4. Radiolarian beds, probably Vicksburg Eocene

a. Sea-level
b. Reef-level
c. Bench
d, *e*. Mountains

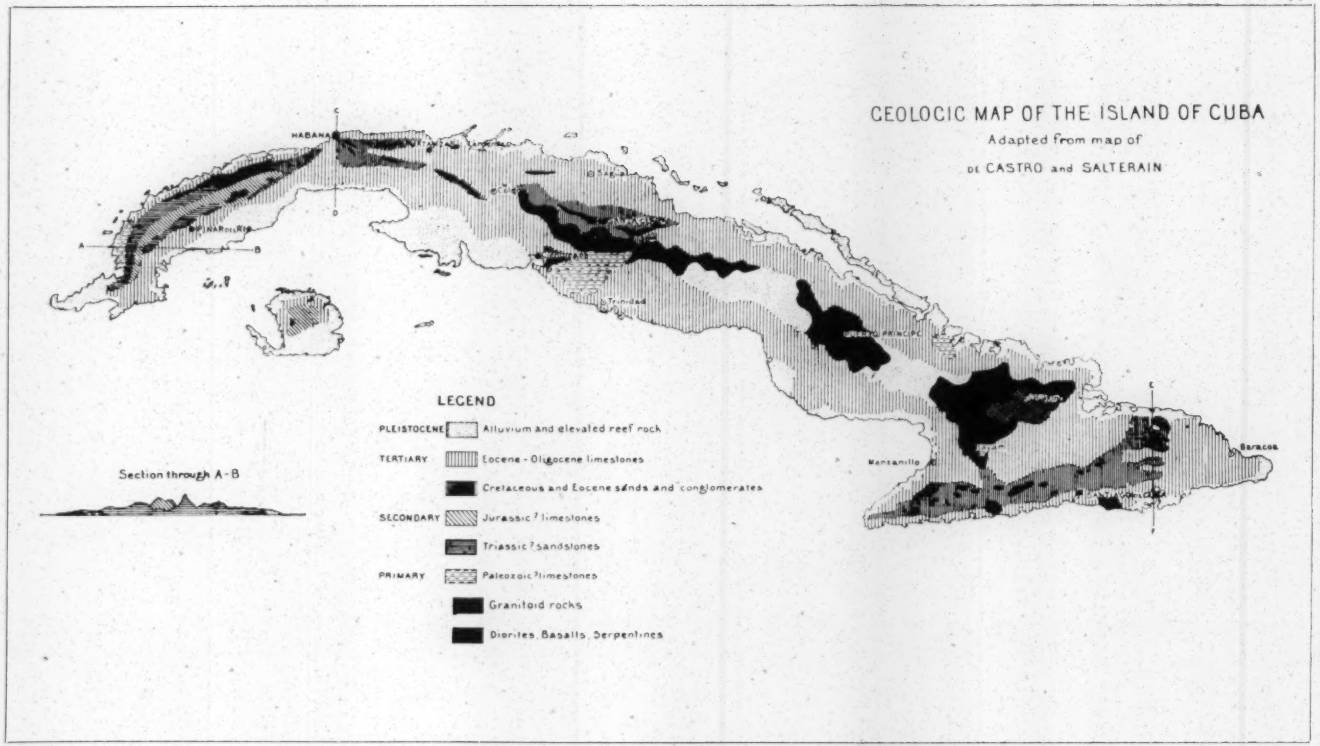
VALLEYS

In the more rugged eastern provinces there are many valleys of wide extent and great fertility. These are numerous also in Santa Clara and Puerto Principe. The most extensive of them, however, is that of the Rio Cauto in Santiago de Cuba. It is situated in a protected position between rugged eminences on the north and south and threaded by a navigable river. This valley is densely populated and has been one of the great strongholds of the present uprising.

By provinces the relief may be summarized as follows: Santiago de Cuba is predominantly a mountainous region of high relief, especially along the coasts, with many interior valleys. Puerto Principe and Villa Clara are broken regions of low mountain relief, diversified by extensive valleys. Matanzas and Habana are vast stretches of level cultivated plain, with only a few hills of relief. Pinar del Rio is centrally mountainous, with fertile coastward slopes.

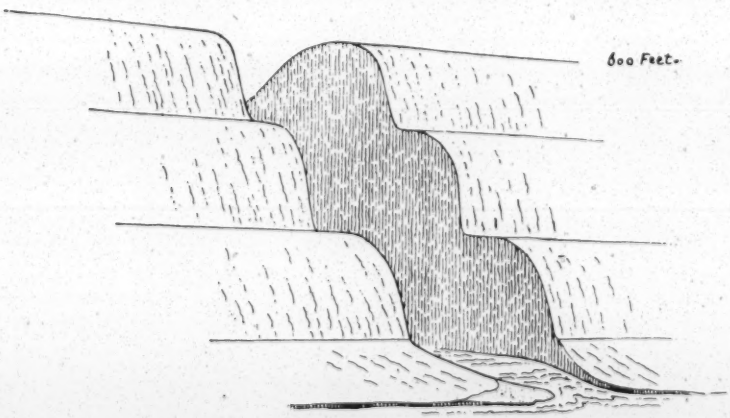
DRAINAGE

The drainage of Cuba is abundant, varying in character in different parts of the island. Considering the limited catchment areas, these streams are remarkably copious in volume. In the plains of the central and western provinces the streams flow from the central axis toward the corresponding coast and have opalescent waters, like those of the limestone springs of Texas and Florida. These streams run through widely sloping valleys, with only slightly indented streamways, and are remarkably free from lateral ramifications. Canyons are not developed until they reach the abrupt plateau edge of the north coast.


GEOLOGIC MAP OF THE ISLAND OF CUBA
Adapted from map of
DE CASTRO and SALTERAIN
HABANA
Matanzas
Trinidad
Manzanillo
Baracoa
Section through A-B
LEGEND
PLEISTOCENE
Alluvium and elevated reef rock
TERTIARY
Eocene - Oligocene limestones
Cretaceous and Eocene sands and conglomerates
SECONDARY
Jurassic? limestones
Triassic? sandstones
PRIMARY
Paleozoic? limestones
Granitoid rocks
Diorites, Basalts, Serpentines

Many of the southward-flowing streams of this portion of the island do not reach the sea directly, but disperse into vast cienegas and swamps. Several of the stream valleys, like that of the Yumuri of Matanzas, are accompanied by some of the most restful and beautiful landscapes in the world. The Rio Armendaris, which nearly encircles Habana on the southward, affords that city an abundant supply of water. In this and other portions of the island where the limestone formation prevails, as in all the white limestone areas of the tropics, a large portion of the drainage is subterranean, accompanied by many remarkable caverns. The rivers Cuyajabos, Pedernales, Guanajay, Copellanias, San Antonio, and others along the south slope of Pinar del Rio disappear in limestone caverns, where they continue their seaward course. The falls of Rosario in this province are of great beauty, as also is an immense natural bridge.

In the province of Santiago and part of Puerto Principe the drainage is more complicated. The limestone plateaus of north and east Santiago de Cuba give rise to many rivers, the most remarkable of which are the Cabanas, the Yamanigacy, and the Moa, which in descending the escarpments of the high levels of the Toar disappear beneath the surface and reappear on a lower terrace, over the edge of which they are precipitated in cascades of 300 feet to the coast. Other streams of this region, such as the Yumuri of the east, find outlet through sharply cut canyons indenting the limestone cliffs of the back coast border. The central portion of this province is dominated by the Rio Cauto and its ramifications. This is the longest river on the island, and



MOUTH OF THE YUMURI OF THE EAST, NEAR BARACOA, SHOWING ELEVATED TERRACES

NAT.GEOG.MAG.

CUBA

COMPILED FROM BEST KNOWN AUTHORITIES

BY ROBERT T. HILL

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ALFONSO XII
CORRAL FALSO
S. DOMINGO
REMEDIOS
CAIMITO
LA ESPERANZA
SANTA CLARA
CIENFUEGOS
ESPIRITU
BANAO
JUNCAL
SWAMP
GULF DE CAZONES
BANCOS DE LOS JARDINES Y JARDINILLOS
CAYOS DOCE LEGUAS
BAHIA DE BUENA ESPERANZA
MANZANILLO
BAYAMO
JIGUANI
CIEGO DE AVILA
MORON
TRINIDAD
JUBITAS
LAGUANA
LIMONES
SUBARO
S. GERONIMO
PUERTO PRINCIPE
MIGUEL DE NUEVITAS
GUAYMARO
LAS TUNAS
HOLGUIN
SANTIAGO DE CUBA
EL COBRE
SIERRA MAESTRA

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

flows in a westerly direction for a distance of 150 miles, draining the wide and fertile valley to which its name is applied. This stream is navigable for small boats for a considerable distance (80 to 100 miles), but its mouth has been obstructed by bars.

FLORA

The surface of the island is clad in a voluptuous floral mantle, which, from its abundance and beauty, first caused Cuba to be designated the Pearl of the Antilles. In addition to those introduced from abroad, over 3,350 native plants have been catalogued. Humboldt said, "We might believe the entire island was originally a forest of palms, wild limes, and orange trees." The flora includes nearly all the characteristic forms of the other West Indies, the southern part of Florida, and the Central American seaboard. Nearly all the large trees of the Mexican Tierra Caliente, so remarkable for their size, foliage, and fragrance, reappear in western Cuba. Over 30 species of palm, including the famous royal palm (*Oreodoxa regia*), occur, while the pine tree, elsewhere characteristic of the temperate zone and the high altitudes of the tropics, is found associated with palms and mahoganies in the province of Pinar del Rio and the Isle of Pines, both of which take their names from this tree.

Among other woods are the lignum vitæ, granadilla, the cocoa wood, out of which reed instruments are made, mahogany, and Cedrela odorata, which is used for cigar boxes and linings of cabinet work.

Although 300 years of cultivation have exterminated the forests from the sugar lands of the center and west, it is estimated that in the hills of those districts and the mountains of the east nearly 13,000,000 acres of uncleared forest remain.

Rich and nutritious grasses are found throughout the island, affording excellent forage for stock. The pineapples, manioc, sweet potato, and Indian corn are indigenous to the island. When the flora of Cuba is studied geographically, it will doubtless be divided into several subdivisions.

CLIMATE

Climatologic records are not available, except for Habana, and these are not applicable to the whole island, where it is but natural to suppose that the altitudes and position of the high mountains produce great variations in precipitation and humidity,

AVENUE OF PALMS ON SUGAR ESTATE — MATANZAS

such as are observable in adjacent islands. The Sierra Maestra probably presents conditions of temperature very nearly the same as the Blue mountains of Jamaica, where the thermometer at times falls almost to the freezing point.

Everywhere the rains are most abundant in summer, from May to October—the rainy season. As a rule, the rains, brought by the trade winds, are heavier and more frequent on the slopes of the eastern end. At Habana the annual rainfall is 40 inches, of which 28 inches fall in the wet season. This rainfall is not excessive, being no greater than that of our eastern states. The air at this place is usually charged with 85 per cent of moisture, which under the tropical sun largely induces the rich mantle of vegetation. The average number of rainy days in the year is 102. There is but one record of snow having fallen in Cuba, namely, in 1856.

At Habana, in July and August, the warmest months, the mean temperature is 82° Fah., fluctuating between a maximum of 88° and a minimum of 76°; in the cooler months of December and January the thermometer averages 72°, the maximum being 78°, the minimum 58°; the mean temperature of the year at Habana, on a mean of seven years, is 77°; but in the interior, at elevations of over 300 feet above the sea, the thermometer occasionally falls to the freezing point in winter, hoar frost is not uncommon, and during north winds thin ice may form. The prevailing wind is the easterly trade breeze, but from November to February cool north winds (*los nortes*, or "northers")—the southern attenuation of our own cold waves—rarely lasting more than forty-eight hours, are experienced in the western portion of the island, to which they add a third seasonal change. From 10 to 12 o'clock are the hottest hours of the day; after noon a refreshing breeze (*la virazon*) sets in from the sea. In Santiago de Cuba the average is 80°; that of the hottest month is 84° and that of the coldest 73°.

The whole island is more or less subject to hurricanes, often of great ferocity. The hurricane of 1846 leveled nearly 2,000 houses in Habana and sank or wrecked over 300 vessels. In 1896 the banana plantations of the east were similarly destroyed. Earthquakes are seldom felt in the western districts, but are frequent in the eastern.

All in all, the climate of Cuba is much more salubrious than it has been painted. The winter months are delightful—in fact, ideal—while the summer months are more endurable than in

most of our own territory. The current impressions of insalubrity have arisen from an erroneous confusion of bad sanitation with the weather. While it is true that sickness follows the seasons, the former would be greatly allayed—almost abated—if public hygiene received proper official consideration.

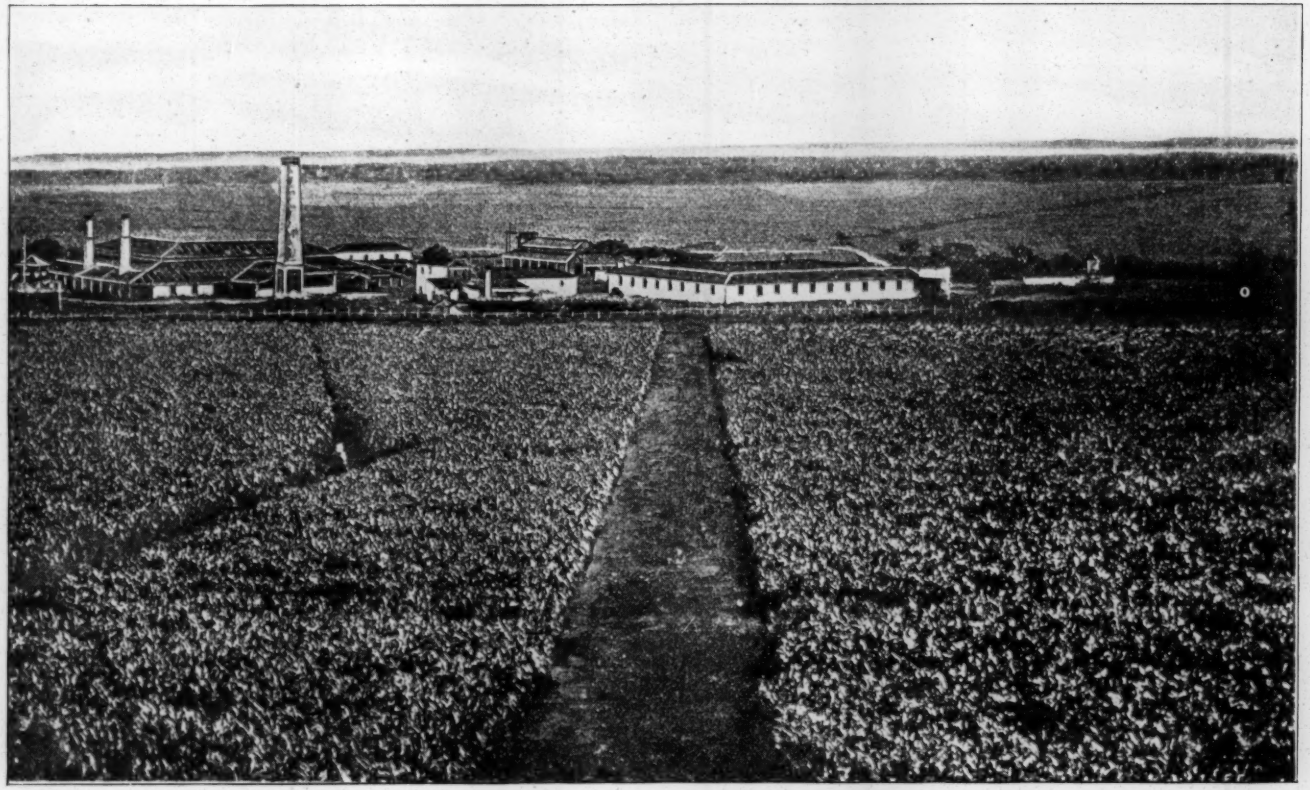
AGRICULTURE

The principal products of Cuba in time of peace are agricultural, and consist of sugar-cane, tobacco, coffee, bananas, corn, oranges, and pines, in the order named. The raising of sugar-cane overwhelmingly preponderates and heretofore has been the mainstay of the island. This industry originated in 1523, when a loan of 4,000 piastres to each person wishing to engage in it was made by King Philip I. The whole of the vast central plain and much of the region from the Cauto westward to Pinar del Rio, except where broken by hills, is one continuous field of cane, which yielded in 1892–93 1,054,214 tons, valued at $80,000,000, besides giving employment to large commercial and transportation interests. The sugar plantations vary in extent from 100 to 1,000 acres, and employ an average of one man to two acres.

The Cuban sugar lands are all upland soils, quite different from the lowlands of Louisiana, and excel in fertility those of all the other West Indies, the cane requiring to be planted only once in seven years, instead of every year, as in Antigua. The machinery of the estates up to the outbreak of the present revolution was the finest and most modern in the world. According to statistics elsewhere presented, this industry has been almost destroyed within the last three years.

Tobacco, while secondary to sugar, is far more profitable in proportion to acreage. This product grows well in all parts of the island, but the chief seat of its cultivation is along the southern slopes of the Cordillera de las Organos, in Pinar del Rio—the famous Vuelta Abajo region, which produces the finest article in the world. Good tobaccos are also exported from Trinidad, Cienfuegos, and Santiago.

In addition to the growth of the leaf, there are dozens of large cigar factories in Habana, giving employment to thousands of people of both sexes and all ages. In 1893 6,160,000 pounds of leaf tobacco and 134,210,000 cigars were exported. Large exports of baled tobacco are also made from the east end of the island, most of which is sent to the United States.



TYPICAL PLAIN — CENTRAL CUBA

Coffee was once extensively exported, but the trees have been mostly cut down and replaced with sugar-cane, in consequence of the greater profitableness of that product. The mountain sides and hill lands of the east are especially favorable for coffee, and a quality as excellent as that of the famous Blue mountain coffee of Jamaica can be readily grown. If the island should ever pass from Spanish hands, this will become a large and flourishing industry. There is still a considerable quantity of coffee grown, but it is nearly all consumed locally.

At the beginning of the present revolution the growing of bananas was a large and important industry, chiefly in the vicinity of Nuevitas and Baracoa, at the eastern end of the island. During the season, from February to December, an average of a ship load a day was exported from Baracoa. This fruit was the largest and finest received in the United States. It was grown upon mesas and plateaus, and let down over the precipitous cliffs by wire trolleys.

Capt. John S. Hart, of Philadelphia, who had large investments in this business and was one of the largest importers of the fruit into the United States, finding his business destroyed by the outbreak of the revolution, promptly turned his ships into filibusters, and after landing many cargoes of arms and ammunition was eventually tried and convicted in a United States court, and is now confined in the Eastern penitentiary, at Philadelphia.

Oranges of delicious flavor grow spontaneously in all parts of the island. No attention is paid to their culture for exportation, however. Pineapples are grown and exported in western Cuba and the Isle of Pines. If the island belonged to the United States, it would undoubtedly become one of the greatest fruit-growing countries. Mahogany and logwood are also exported in small quantities.

In the provinces of Santa Clara, Puerto Principe, and Santiago the cattle industry, owing to the fertile grazing lands, reaches large proportions, the product being large and fine animals of Spanish stock. Horses are also bred in all parts of the island. The Cuban horse is a stout pony descended from Andalusian stock, with the build of a cob and a peculiar pacing gait which renders it an exceptionally easy riding animal. Goats and sheep do not flourish in Cuba, the wool of the latter changing into a stiff hair like that of the former. Poultry flourishes everywhere and was abundant in all markets.

In addition to the large estates of the planters, the island possesses many small farms of less than 100 acres, devoted to products for which there is a demand in the local markets. In 1895 there were over 100,000 farms, ranches, and plantations, valued at $20,000,000.

MINERALS

The mineral resources of the island are iron ores, asphaltum, manganese, copper, and salt. A little gold and silver were mined in past centuries, but never in large quantities. The silver mines of Santa Clara yielded in 1827 140 ounces to the ton, but were soon worked out. The iron mines situated in the mountains a few miles east of Santiago de Cuba are of importance. The production of the Juragua Iron Company in 1890 was 362,068 tons, and constituted one-fourth of the total importation of iron ores into the United States for the same period. These mines were owned by an American company, which had invested extensive capital in them, but the production has been almost destroyed by the present revolution. The ores are mineralogically peculiar, being the result of replacement in limestone. They are mixed brown and red hematite (turgite).

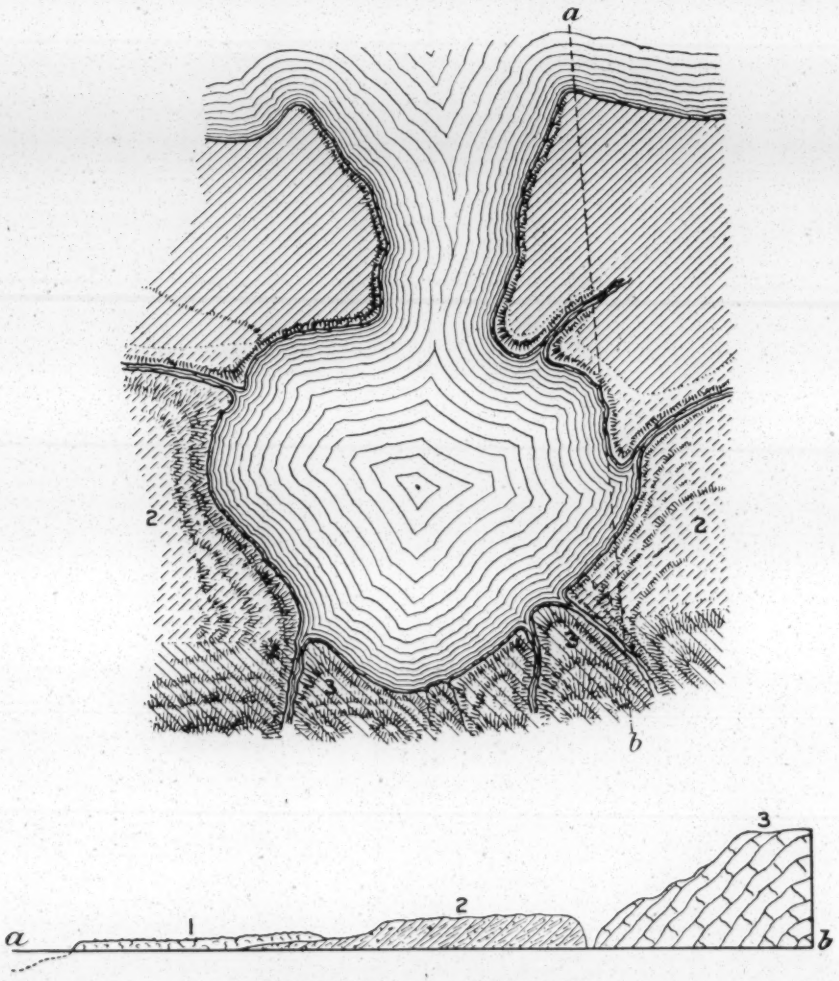
Asphaltum (chapatote) of unusual richness occurs in several parts of the island, in the beds of late Cretaceous and early Eocene age. At Villa Clara occurs an unusually large deposit of this material, which for forty years has supplied the material for making the illuminating gas of the city. American investors bought these mines the year preceding the revolution, and their investment up to date, which would otherwise have been profitable, has proved a total loss.

Copper of extraordinary richness has been worked on the leeward side of the Sierra Maestra range, 12 miles from Santiago de Cuba. In former years these mines yielded as high as 50 tons per day. Current report asserts that they are still very valuable, but are awaiting the return of peace and development. Salt of great purity is found in the cays adjacent to the north coast.

No manufacturing industries except those of tobacco and sugar have been encouraged, the persistent policy of Spain having been to promote the importation of manufactured articles from the mother country. In the writer's travels over the island only a single industrial establishment was seen, namely, a mill at Baracoa for extracting oil from cocoanuts and making soap.

HARBORS

The narrowness of the island and the abundance of good harbors make nearly all parts of it convenient to maritime transportation. Perhaps no country in the world is so blessed with harbors. Not only are they very numerous, but many of them are excellent and afford convenient outlets for the products of



GEOLOGY OF MATA BAY, A TYPICAL HARBOR

1. Elevated reef-rock forming entrance to harbor
2. Yellow beds of Bowden formation
3. Hard white limestones (Vicksburg)

the island and easy access for oceanic and coastal transportation. These harbors are nearly all pouch-shaped inlets indenting the coast, with narrow outlets pointed by elevated reef rock and capable of accommodating large numbers of vessels. They are so conveniently situated as regards different portions of the island that the trade of Cuba may be said literally to pass out at a hundred gates. The chief of these harbors are Habana, Matanzas, Nuevitas, Gibara, Nipe, and Baracoa, on the north coast, and Guantanamo, Santiago de Cuba, Manzanillo, Trinidad, and Cienfuegos, on the south. The last mentioned is said to be one of the finest harbors in the world. Habana, Cienfuegos, and Santiago are regularly visited by American and Spanish steamers, while coastal steamers circumnavigate the island, touching at the minor ports, which are also sought by many tramps and sailing vessels in search of cargoes.

SHIPPING

The shipping trade, both foreign and coastal, is extensive, the American tonnage alone amounting to 1,000,000 per annum. About 1,200 ocean vessels, steam and sail, annually clear from Habana, while the sugar crop finds an outlet at all the principal ports. Lines of steamers coast the island, the north coast being served by lines from Habana and the south by lines from Batabano, the southern entrepot of Habana. The tonnage of Habana and eight other ports for 1894 amounted to 3,538,539 tons, carried by 31,181 vessels.

RAILWAYS

The railways aggregate less than 1,000 miles of line, and consist principally of the united system of Habana, extending through the tobacco and sugar districts of the west and center, and connecting the capital with Matanzas, Pinar del Rio, Batabano, Cienfuegos, and Sagua, the system terminating at Santa Clara, 150 miles east of Habana. The entire half of the island east of Cienfuegos and Sagua is dependent upon water communication, although several short local lines extend interiorward from Nuevitas, Remedios, and Santiago.

There were about 2,810 miles of telegraph line in 1895, including nearly 1,000 miles of cable, connecting the cities of the south coast and the Isle of Pines with Habana, via Batabano.

HIGHWAYS

Good highways are both short and few. In past centuries a few good roads were established of the class called Camino el Rey (the King's highway), leading from Habana into Pinar del Rio and from a few interior cities to their entrepots. Aside from these roads, which were absolute necessities, the government has constructed no highways leading into the country through or around the island, and hence inland communication is much impeded. Had a more far-sighted policy of road construction been undertaken, such as has been carried out by England in the adjacent island of Jamaica,* Spain would have been in no danger of losing her colony, the lack of good military roads having been one of the factors which have made possible the success of the present revolution.

Although Cuba is so situated geographically as to command the commerce of the entire American Mediterranean, trade and communication with the adjacent regions, other than Mexico, have neither been cultivated nor encouraged. To reach any of the adjacent islands, such as Haiti or Jamaica—each less than 100 miles distant—it is usually necessary for the Cuban to proceed first to New York and thence to his destination. A perpetual quarantine appears to exist against the island on the part of all its neighbors. The completeness with which Cuba is isolated commercially is illustrated by the fact that not even the Habana cigar, the most far-reaching of its products, can be found in a single Caribbean city.

CITIES

Habana, which bears upon its escutcheon "Llave del Mundo," the "Key of the New World," is the political capital and principal city of Cuba. It is situated mainly on the west and south sides of a capacious harbor and surrounded by eminences rising to 150 feet in height. It is a picturesque and beautiful place, presenting, even in the midst of the most horrible tragedy of the centuries, the gay appearance of a European city. In fact, in population, interest, customs, and dominant political feeling the city (being the seat of the foreign government which rules the island) is thoroughly Spanish, and in this sense is entirely

*Jamaica, while only one-tenth the size of Cuba, possesses over 2,000 miles of superb highway, affording easy communication to every part of the island.

MATANZAS BAY

unrepresentative of the local customs and sentiments of provincial Cuba. Its commerce is ordinarily enormous, while large pleasure drives, parks, clubs, and public institutions give it picturesque variety. Conspicuous among notable objects are the wharves, fortifications, hospitals, the university, the botanical garden, government palaces, and several churches, including the cathedral, which claims to possess, like Santo Domingo, the remains of Columbus. This city was founded early in the 16th century (about 1519) nearly 100 years before the first colonization of our seaboard. Until recently it was badly supplied with water, and its sewerage is still abominable. In 1895 a modern system of waterworks was installed by New York engineers, who also prepared plans for the solution of the sewerage problem.

The foreign trade of Habana amounts to $50,000,000 yearly, and is chiefly carried on by American steamers. From the city radiate several lines of railway, which bring to it the products of the interior. The only cable connection with the United States is made here.

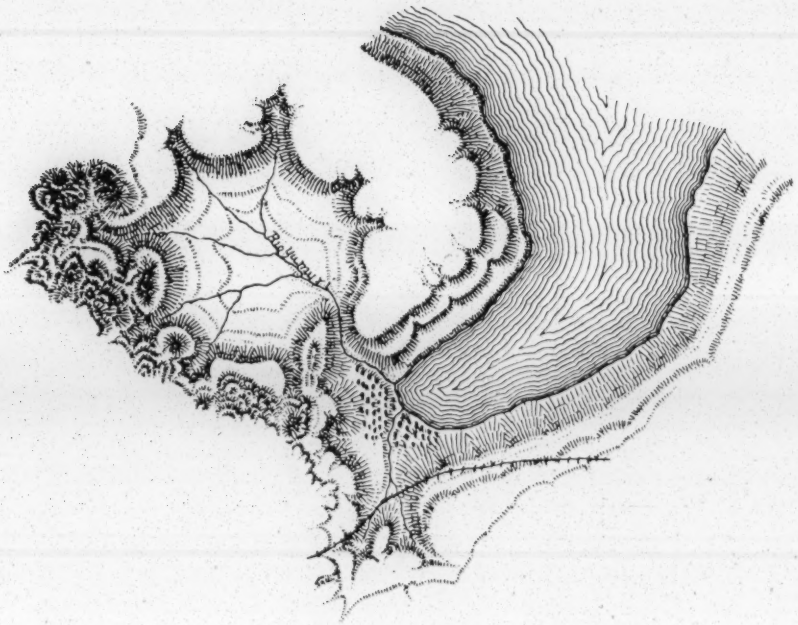
West of Habana there are several small ports, such as Mariel, Cabanas, and Bahia Honda, which are similar in their formation to that of Habana, but are places of secondary importance. South and east of the city were flourishing places, the largest of which is Guanabacoa, crowning a hill which commands a fine panoramic view of the capital, its roadsteads and environments.

Habana has easy access to the south coast by rail, terminating at the miserable village of Batabano, 25 miles distant, which is an entrepot for the city. Here the coastal cable from Santiago touches and from this point radiate various lines of steamers along the coast and to the Isle of Pines.

The second city and seaport of central Cuba is Matanzas, about 75 miles east of Habana. This city was founded in 1693. It is the chief outlet for that part of the sugar region which stretches south and east toward Cardenas, and which includes the most fertile lands in Cuba. The harbor, like many others, through the *laissez faire* policy of the Spanish government, has been allowed to fill with sediment, and hence the larger steamers are obliged to load in the roadstead.*

Cardenas, founded in 1828, is one of the few towns of Cuba which can boast of having been born in this century. It lies on

* In view of the strategic importance which Matanzas is assuming in the campaign which has opened since this article was written, the several illustrations given of this vicinity will prove of interest.



MATANZAS BAY AND YUMURI VALLEY

a spacious bay sheltered by a long promontory. It is one of the principal sugar-exporting places of Cuba, and is connected by rail with Habana, and by regular steamers with all the coast towns.

East of Cardenas for a considerable distance life and industry are shifted from the northern to the southern seaboard toward Cienfuegos and Trinidad.

Cienfuegos is a modern place, situated on a magnificent harbor. Although surveyed by Ocampo in 1508 and spoken of by Herrera as a haven unrivaled in the world, the town was only settled in 1819 by refugees from Santo Domingo. Within the past twenty years its port has increased enormously. It is now the second seaport in the island.

Trinidad, to the east of Cienfuegos, dates from the first years of the conquest, and has no fewer than three harbors and an excellent roadstead. It suffered largely from the incursions of the French and English buccaneers. The city has a picturesque setting, surrounded by high hills and mountains.

East of Trinidad, which is near the central meridian of the island, important cities begin to appear in the interior, such as Santa Clara, Esperanza, Puerto Principe, and Holguin. These

places are the most truly Cuban and representative in their population of any towns on the island.

Santa Clara is a beautiful city, dating from previous centuries, and surrounded by charming scenery. It possessed, the year before the revolution, a cultured creole* population. The insurrection has raged most fearfully around this place, and it is probable that its most representative people have been largely driven away or destroyed.

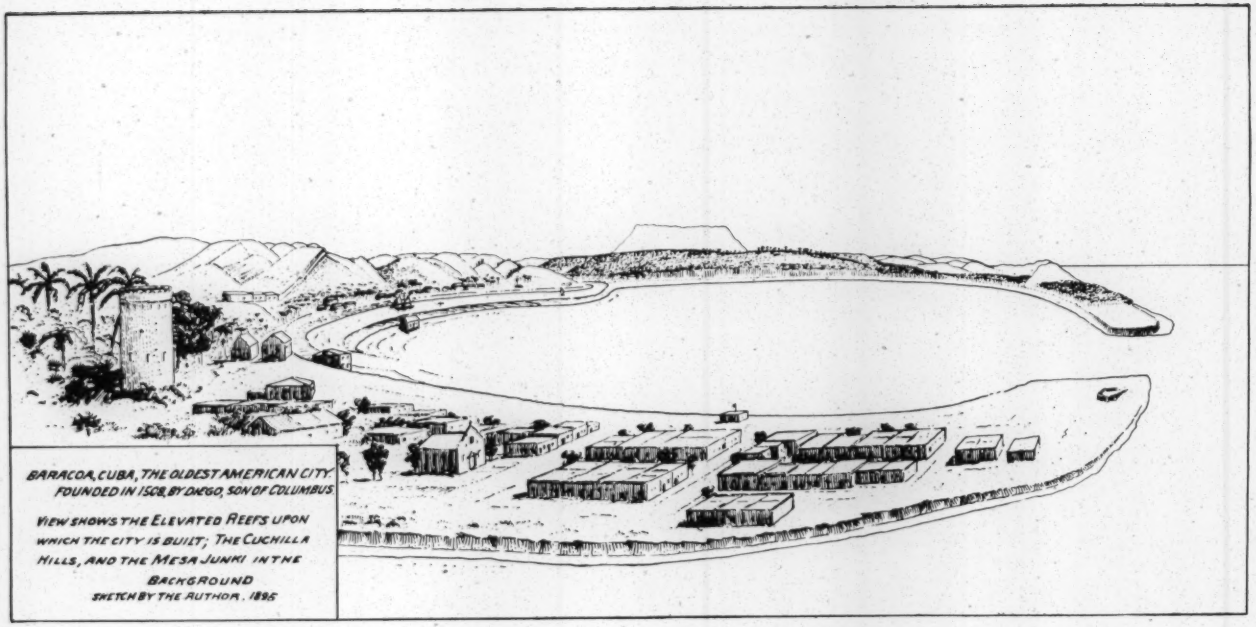
Camaguey, as the Cubans call the town, or Puerto Principe, as it is officially designated, although remote from the seacoast, is the chief interior city of Cuba, and claims to be the most creole of Cuban towns. The city lies on a plain about midway between the two coasts, and is connected by rail with Nuevitas to the northeast.

In the basin of the Cauto, Bayamo is the principal place. This is a very old town, which was founded on a southern affluent of the main stream during the first years of the conquest. It was at Yara, a little southwest of this place, that the great republican rising took place in 1868. The next year, when the Spanish troops made their appearance, the inhabitants themselves set fire to their houses. During the present revolution Bayamo has been an important stronghold. Holguin, lying to the northward of the Cauto, is also an important city of this portion of Cuba.

Returning to the northern seacoast, several important points remain to be described east of the central meridian of the island. Without considering the innumerable smaller landings, the principal towns are Nuevitas, Padre, Gibara, Banes, Nipe, and Baracoa. These are all antique and interesting places, possessing many old ruins and fortifications. Baracoa, the easternmost port of the north coast of the island, is of historic interest, inasmuch as it is the oldest continuous settlement of the New World, having been settled by Diego Columbus, the son of Christopher, in the year 1511.† The inhabitants still point with pride to the ruins of his house. It will also go down in history as the point near which, on the 25th of February, 1896, Antonio Maceo and his valiant band of nineteen followers, by a most daring and successful landing, started the present revolution, and from which within a year's time he marched to the western extremity of the

*The word creole, as used in this paper, means white descendants of the Latin races. The impression on the part of some people that the word implies a mixture of negro blood is an ignorant and, to the creole, an insulting mistake.

†In the illustration the date is erroneously given as 1508.



BARACOA, CUBA, THE OLDEST AMERICAN CITY
FOUNDED IN 1508 BY DIEGO, SON OF COLUMBUS

VIEW SHOWS THE ELEVATED REEFS UPON WHICH THE CITY IS BUILT; THE CUCHILLA HILLS, AND THE MESA JUNKI IN THE BACKGROUND

SKETCH BY THE AUTHOR. 1895

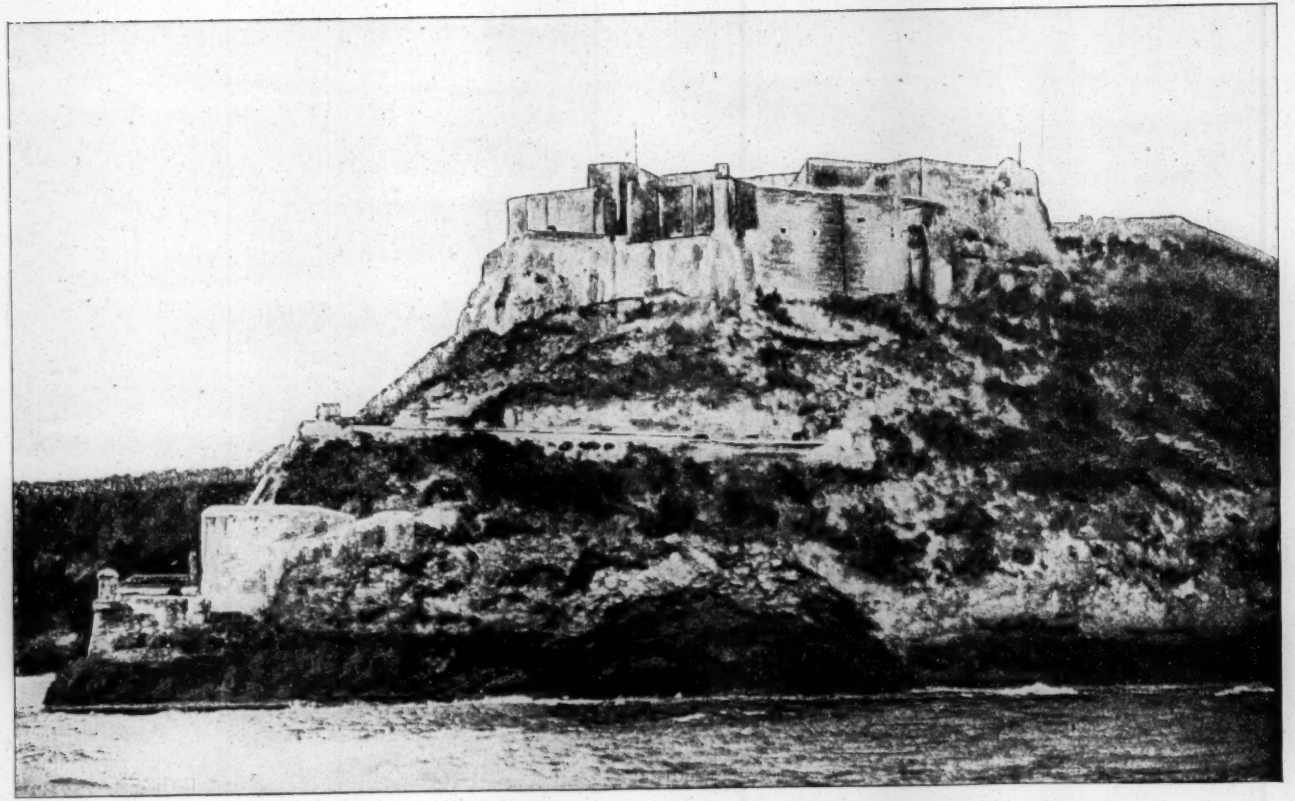
island, winning battle after battle, and was only checked by treachery and assassination. Baracoa at the beginning of the present revolution was again becoming an important commercial city, being the seat of the banana and cocoanut trades.

Returning again to the south side of the island, there are three ports of importance east of Trinidad, and these are all situated on the south or west coast of the Sierra Maestra peninsula. The westernmost of these is Manzanillo. This is the chief outlet of the fertile valley of the Cauto. Since the close of the ten years' revolution and up to the recent outbreak it was acquiring an increasing trade in tobacco, sugar, wax, honey, and other produce.

Santiago, as it is called by the Americans, Saint Jago or simply Cuba by the natives, is a port second only to Habana in strategic and political importance. It is the capital of the eastern department as well as its most flourishing seaport. It is located on one of the many pouch-shaped harbors which outlet to the sea through a narrow gateway, like that of Habana, but with an entrance dotted by many islands with handsome villas. At its narrowest part this outlet is only 180 yards wide, but it gives access to a magnificent basin, with many indentations, large enough to accommodate all the shipping of the island. Its many-colored structures, promenades, gardens, and superb prospects over the valley make Santiago one of the most marvelous cities of the Antilles. The town is well fortified and has been practically the only stronghold of the Spanish authorities in eastern Cuba during the present revolution. Back of the city the overtowering cliffs of the Sierra Maestra separate it from the interior. Several lines of railroad run from the city to the iron mines, 16 miles east, where Pennsylvania capitalists were employing nearly 2,000 hands at the date of the recent outbreak. The city is the telegraphic center from whence radiate the submarine coastal cables of the island for the western department, Mexico, Jamaica, South America, Haiti, Porto Rico, and the Lesser Antilles.

INHABITANTS

Perhaps there is no question upon which the American people are so ill informed as upon that of the population of Cuba. It is impossible to obtain accurate statistics, owing to the fact that no reliable census has been taken by the government for many decades. All figures which may be presented are merely estimates, and great variation is found in those given by different authorities.



OLD FORTIFICATION AT ENTRANCE TO SANTIAGO DE CUBA

The latest census of Cuba, published December 31, 1887, gives the population as follows:*

Provinces.	Area, sq. klms.	White.	Colored.	Total.	Pr. ct. of col'd race.	Density.
Habana.....	8,610	344,417	107,511	451,928	24	52.49
Pinar del Rio....	8,486	167,160	58,731	225,891	26	26.62
Matanzas.....	14,967	143,169	116,409	259,578	45	17.34
Santa Clara.....	23,083	244,345	109,777	354,122	31	15.34
Puerto Principe..	32,341	54,232	13,557	67,789	20	2.10
Santiago de Cuba.	35,119	157,980	114,399	272,379	42	7.76
Total	122,606	1,111,303	520,384	1,631,687 Average.	32	13.31

The population of the principal towns has been estimated as follows:

	Towns.	Population.		Towns.	Population.
West	Habana.....	198,720	Central	Puerto Principe.	46,640
	Guanabacoa....	29,790		Cienfuegos. ..	27,430
	Regla.....	11,280		Santo Espiritu..	32,600
	Matanzas.	27,000		Trinidad	27,640
	Pinar del Rio....	21,770	East ..	Santiago.....	71,300
	Colon.....	20,400		Holguin	34,760
	Cardenas.....	23,680		Manzanillo	23,200

Few realize the important fact that environment is quite as potent a factor as racial or political conditions in producing the social status, and nowhere is this great principle more plainly exemplified than in the West Indies and tropical mainlands, where adjacent islands present most striking contrasts in the character and conditions of their populations. The Antiguans, Barbadians, Barbudans, Martiniques, Jamaicans, Haitians, and Cubans are socially and racially as distinct from each other as are the inhabitants of the great countries of Europe. Were it not for the facts of history, one would believe that each population was indigenous to its habitat, instead of having been transplanted from the Old World within four centuries.

Nowhere are these distinctions more apparent than in the four Antilles themselves, especially as seen in the islands of Cuba,

*Published in No. 3, vol. XI, of the Revista de Cuba.

Haiti, and Jamaica, the people of which have hardly one trait in common.

Cuba and Porto Rico are the only two tropical islands where the white race has become thoroughly acclimated, and Cuba alone contains ten times more whites of Spanish stock than all the British West Indies contain whites of English stock.

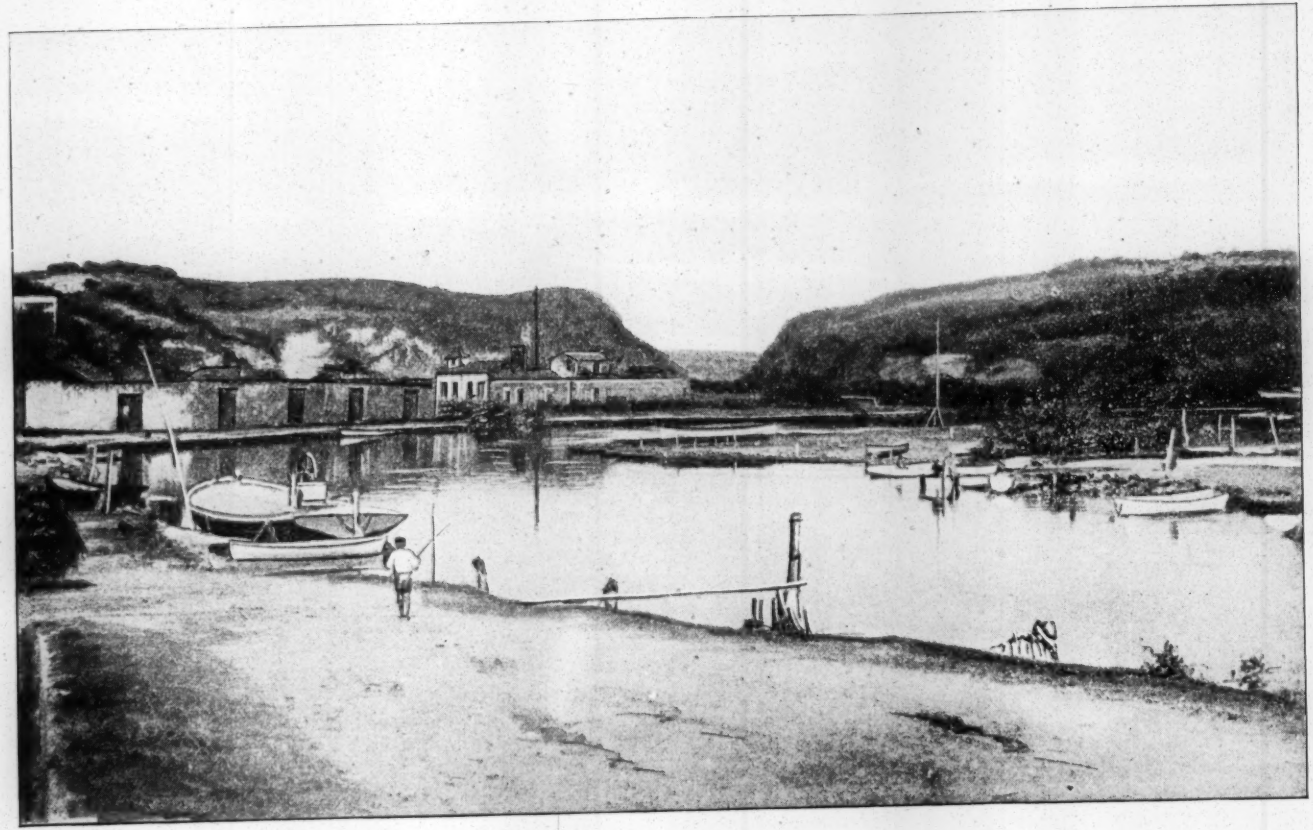
FOREIGNERS

Of the total population of Cuba about 30,000 are Chinese male laborers. The Spanish born, not counting the present army of invasion, probably do not exceed 30,000, while counting all others there are not over 50,000 Caucasian foreigners. This foreign population, except the Chinese, is engaged in office-holding, trade, and shipping, and is largely confined by residence to the cities, which contain fully one-third of the total population. These foreigners, having no other interest in the welfare of the country than gain of wealth, and possessing no intention of permanent residence, should not be considered in any manner as representative of the Cuban people, although, alas, their voice has, in recent political events, almost drowned that of the true inhabitants.

To the Cubans the foreign Spaniards are known as Intransigentes, and between the two classes, the governors and the governed, owing to the despotism of the former, a bitter hatred has existed since 1812, and has been more strongly accentuated since the surrender of Zanjon, in 1876, when the rebellious Cubans laid down their arms under unfulfilled promises of autonomy and local self-government similar to schemes lately presented.

THE CUBANS

Seventy-five per cent of the native population of the island is found outside of the Spanish capital of Habana, which, being the seat of an unwelcome foreign despotism, is no more representative of Cuban life or character than is the English city of Hong-Kong of the rural Chinese. While the Habanese have had the freest communication with the United States during the last three years of the revolution, Americans have had little opportunity to hear from the true white Cuban population. The Cubans are mostly found in the provinces and provincial cities, especially in Pinar del Rio and the eastern provinces of Santa Clara, Puerto Principe, and Santiago. Although of Spanish



YUMURI CANON, BACK OF MATANZAS CITY

blood, the Cubans, through adaptation to environment, have become a different class from the people of the mother country, just as the American stock has differentiated from the English. Under the influence of their surroundings, they have developed into a gentle, industrious, and normally peaceable race, not to be judged by the combativeness which they have developed under a tyranny such as has never been imposed upon any other people. The better class of Camagueynos, as the natives are fond of calling themselves, are certainly the finest, the most valiant, and the most independent men of the island, while the women have the highest type of beauty. It is their boast that no Cuban woman has ever become a prostitute, and crime is certainly almost unknown among them.

While these people may not possess our local customs and habits, they have strong traits of civilized character, including honesty, family attachment, hospitality, politeness of address, and a respect for the golden rule. While numerically inferior to the annual migration of Poles, Jews, and Italians into the eastern United States, against which no official voice is raised, they are too far superior to these people to justify the abuse that has been heaped upon them by those who have allowed their judgment to be prejudiced by fears that they might by some means be absorbed into our future population.

Notwithstanding the disadvantages under which the Cubans have labored, they have contributed many members to the learned professions. To educate their sons and daughters in the institutions of the United States, England, and France has always been the highest ambition of the creoles of Cuba and Porto Rico. The influence of their educated men is felt in many countries, the most distinguished professor of civil engineering, two leading civil engineers of our navy, and the most eminent authority on yellow fever in our country belonging to this class. Thousands of these people, driven from their beloved island, have settled in Paris, London, New York, Mexico, and the West Indies, where they hold honorable positions in society, and even the exiles of the lower classes, with their superior agricultural arts, have been eagerly welcomed in countries like Jamaica, Mexico, and Florida, which hope to share with Cuba the benefits of its tobacco culture.

These are the people who are the leaders of the movement for Cuba Libre and who struggled so valiantly to throw off the yoke of an inferior governing class. No cause in all history has been

more just than theirs, no self-sacrificing heroism greater, and yet the world, during all the agitation of the past three years, has known little of them, so completely have they been cut off from communication, while such little as has been heard has had to find its outlet through the stronghold of their enemies.

THE NEGROES

In addition to the white creole population, 32 per cent are black or colored—using the latter word in its correct signification, of a mixture of the black and white. This black population of Cuba has been as little understood in this country as has been the creole, especially by those who have alleged that in case Cuba should gain her freedom the island would become a second Haiti. The black and colored people of the island as a class are more independent and manly in their bearing than their brethren of the United States, having possessed even before slavery was abolished on the island the four rights of free marriage, of seeking a new master at their option, of purchasing their freedom by labor, and of acquiring property. While the negro shares with the creole the few local rights possessed by any of the inhabitants, their social privileges are greater than here, although a strong caste feeling exists. Miscegenation has also produced many mulattoes, but race mixture is no more common than in this country.

The colored people of Cuba belong to several distinct classes. The majority of them are descendants of slaves imported during the present century, but a large number, like the negroes of Colombia and the maroons of Jamaica, come from a stock which accompanied the earliest Spanish settlers, like Estevan, the negro, who, with the two white companions of Cabeza de Vaca, first crossed the United States from the Gulf of Mexico to California in 1528–36. The amalgamation of this class in the past century with the Spanish stock produced a superior class of free mulattoes of the Antonio Maceo type, unlike any people in this country with which they can be compared.

The current expressions of fear concerning the future relations of this race in Cuba seem inexplicable. The slaves of the South were never subjected to a more abject servitude than have been the free-born whites of Cuba, for they at least were protected from arbitrary capital punishment, imprisonment, and deportation without form of trial, such as that to which all Cubans are

VILLAGE BETWEEN HABANA AND MATANZAS

still subjected, and the white race of this or any other country has furnished few more exalted examples of patriotism than the mulattoes Toussaint L'Ouverture or Antonio Maceo.

The experiences of the past have shown that there is no possibility of Cuba becoming Africanized without constant renewal by immigration. The 520,000 colored people, one-half of whom are mulattoes, represent the diminished survival of over 1,000,000 African slaves that have been imported. The Spaniards had the utmost difficulty in acclimatizing and establishing this race upon the island. While Jamaica and other West India islands are a most prolific negro-breeding ground, the race could not be made to thrive in Cuba.

Those persons who undertake to say what the social conditions of Cuba would be under independence should look elsewhere than to Haiti for a comparison. Even were the population of Cuba black, as it is not, the island of Jamaica would afford a much better contrast. This island, only about one-tenth the size of Cuba, is composed of mountainous lands like the least fertile portion of Cuba; has a population wherein the blacks outnumber the whites 44 to 1; yet, under the beneficent influence of the English colonial system, its civilization is one of which any land might be proud, possessing highways, sanitation, and other public improvements even superior to those of our own country, and such as have never been permitted by Spain in Cuba. Even though Cuba should become a second Haiti, which it could not, there is some satisfaction in knowing, in the light of historic events, that Haiti free, although still groveling in the savagery which it inherited, is better off than it would have been had Napoleon succeeded in forcing its people back into slavery, as he endeavored to do.

Another fact which will stand against the Africanizing of Cuba is that it is highly probable that nearly one-half of these 500,000 colored people have been destroyed during the present insurrection. A large number of them had but recently been released from the bonds of slavery, and were naturally the poorer class of the island, upon which the hardships have mostly fallen, being generally the field hands in the sugar districts of Habana, Matanzas, and Santa Clara, where the death rate of the terrible Weyler reconcentramiento has been greatest. Three hundred thousand of the 500,000 blacks belonged to these provinces, and of this number fully one-half have been starved to death. The population of Cuba has undergone great modification

since the collection of the statistics given. What changes the deplorable conflict has wrought can only be surmised. Beyond doubt, however, the population has at least been reduced to a million inhabitants by emigration of non-combatants, destruction in battle, official deportation of suspects and political prisoners, and by the reconcentration.

The rural population of the four western provinces of Pinar del Rio, Habana, Matanzas, and Santa Clara has been totally obliterated. Estimates of this extermination are all more or less conjectural, but the Bishop of Habana is authority for the statement that more than 400,000 people have been buried in the consecrated cemetery.

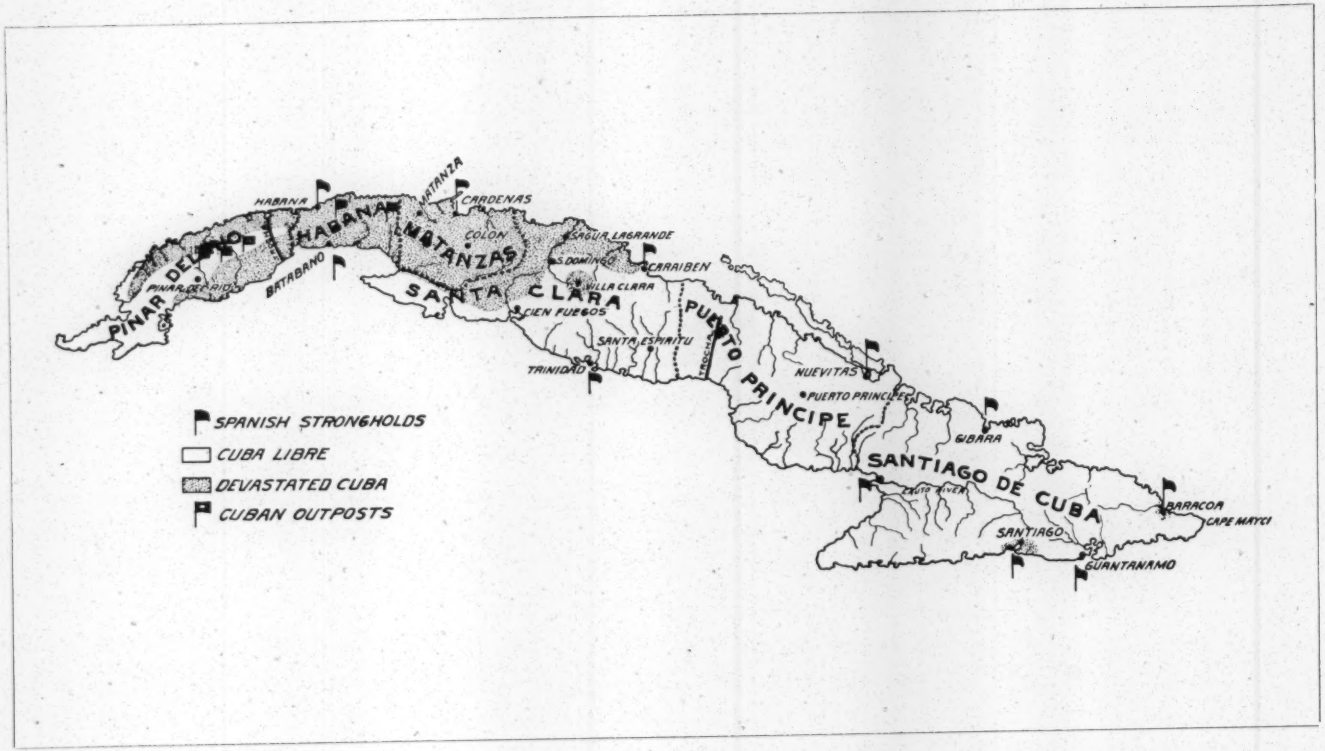
The shaded portions of the accompanying diagram show the depopulated portions of Cuba.

RELIGION AND EDUCATION

Cuba is divided into two dioceses, which are the archbishopric of Santiago de Cuba, containing 55 parishes, and the bishopric of Habana, containing 144 parishes. No Cuban-born priests are found in any church of importance. In the cathedral chapter at Habana there is only one Cuban, and only two natives have ever obtained any especial preferment—the miter never.

The same oppression obtains in the church as in the state, the former being used for base ends in thousands of instances, and against the protest of the authorities at Rome. While nominally Catholics, and so holding that church responsible for what they do, many Spaniards, in and out of Cuba, are very poor Catholics in fact, and they do hundreds of things which the church authorities by no means approve. For example, the Cuban native who becomes a Roman Catholic priest fares about as badly as does the Protestant preacher.

There is not a parish on the whole island that supports an endowed school. Recently there was a crusade against the civil marriage ceremony. The objection came because of the loss of fees to the priest. The crusade was led by the Spanish-born priest, who charges Cubans fees twice as high as he does Spaniards. Parishes are farmed out on account of profits—not by the church, but by the Spaniards. No priest gets these desirable parishes unless he happens to have been born in Spain. It is the Spanish blood that contaminates the church, and not the church that does the injury. It is partly the Spaniards' acts in introducing abuses into the church that brought about the pres-


HABANA
MATANZA
CARDENAS
COLON
SAGUA LAGRANDE
S. DOMINGO
CARAIBEN
VILLA CLARA
CIEN FUEGOS
SANTA ESPIRITU
TRINIDAD
NUEVITAS
PUERTO PRINCIPE
GIBARA
BARACOA
CAPE MAYCI
SANTIAGO
GUANTANAMO
PINAR DEL RIO
BATABANO
PINAR DEL RIO
HABANA
MATANZAS
SANTA CLARA
PUERTO PRINCIPE
SANTIAGO DE CUBA
SPANISH STRONGHOLDS
CUBA LIBRE
DEVASTATED CUBA
CUBAN OUTPOSTS

ent insurrection. The insurgents are Catholics and love their church. The religious condition of the island is as bad as the political.

Education is still much neglected. The chief educational institutions are the Habana University, two professional schools, with meteorological observatories attached, one agricultural school, and two seminaries. There are several private as well as public schools, aggregating in all 750 institutions, with some 30,000 students and scholars.

The Habana University is modeled after the Spanish universities, and its curriculum is chiefly devoted to medicine, law, theology, and an obsolete system of philosophy. Its entire faculty was disposed of by imprisonment and banishment last year, while the students have always been looked upon with a suspicion of sedition. The public schools are decidedly few, most of the better Cubans patronizing the private institutions.

COURTS

Cuba has two high courts; but the captain-general is above either court, as appears from the royal decree of June 9, 1878, defining his duties and prerogatives. His power not only overrules decisions of all the judicial authorities, including the justices of the court of judicature, but also enables him to withhold the execution of any order or resolution of the home government "whenever he may deem it best for the public interests."

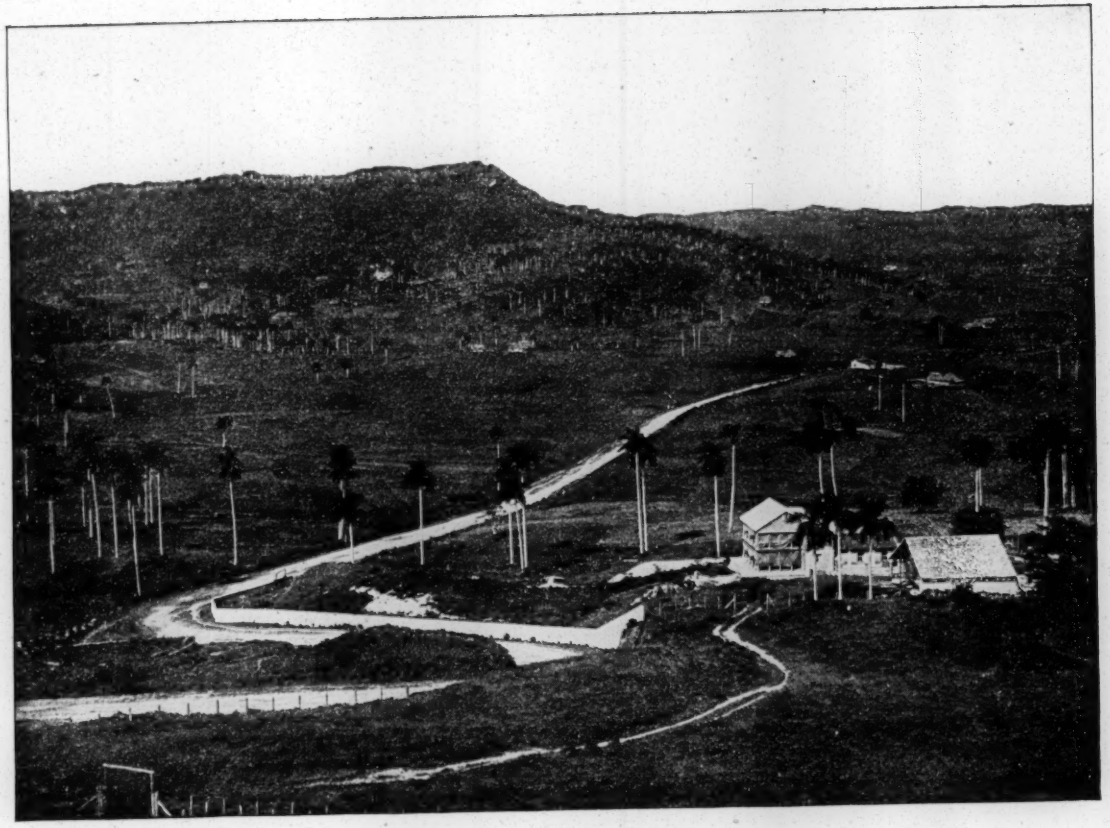
ADMINISTRATION

Since its discovery Cuba has been a crown colony of Spain, occupying a relation to that country, so far as the absence of local self-government is concerned, comparable to that which Alaska occupies to this, but governed by military instead of civil authority. Some of the Spanish islands, like the Canaries and Balearics, are integral parts of the mother country, having equal rights with the people of the peninsula. Cuba, however, has ever been treated solely as a subordinate colony. The central and absolute authority of the crown has been represented by a governor, called the captain-general, controlling the land and sea forces and residing at Habana, and having the right of setting aside all judgments of the local courts. His authority has been backed, even in times of peace, by a Spanish soldiery larger than the army of the United States and with police powers unknown in this country. In addition to the army of soldiers, there is a

vast horde of subordinate officials, all Spaniards, who collect the customs and attend to other minor executive duties.

The lower classes of the Habana male population—porters, draymen, and clerks—are organized into a dangerous and oftentimes uncontrollable military force, known as the volunteers, who, while never having been known to take the field, are a serious menace to the peace of the city, being feared equally by the authorities, over whose heads they wave the threat of mutiny, especially upon any indication of granting reforms, and by the resident and unarmed Cubans, over whom they hold the threat of massacre. Up to date the record of this organized mob has been a series of horrible crimes, such as shooting down a crowd of peaceable citizens as they emerged from the theater, firing into the office and dining-room of a hotel, assaulting the residences of Cuban gentlemen, and in 1871 forcing the authorities to execute 43 medical students, all boys under twenty, because one of them had been accused of scratching the glass plate on a vault containing the remains of a volunteer. Fifteen thousand volunteers witnessed with exultation this ignoble execution.

While the primary functions of the government have been to attend to the prerogatives of the Crown and the collection of revenues, its attention has been largely devoted to the personal enrichment of the officials through misfeasance and the prevention of the secession of the island. It has practically ignored the other functions of government, such as the collection of statistics, the promotion of education, and the establishment of public works and proper public sanitation. Few, if any, educational institutions have been erected at public expense; no public highways have been constructed, nor have any improvements of a public character been made outside of the city of Habana. Even when the Cubans have undertaken such improvements, they have been heavily taxed for the benefit of the Spanish officials. The administration of Cuba is and has been since the settlement of the island an absolute military despotism on the part of the mother country. At periods, dependent upon the personality of the captain-general, there have been epochs of peace and prosperity, but since the middle of the present century the island has been in a state of insurrection, dormant or eruptive, accompanied by a growing hatred between the governing and the governed classes, with constantly increasing restrictions upon the latter. At times the revolting people were reduced to subjection by promises of local self-government, which have invariably been broken.



THE YUMURI VALLEY, NEAR MATANZAS

During the present century the Spanish Crown has made various pretenses of giving to the inhabitants of the island greater political privileges, but all of these, down to the latest and present autonomy scheme, have been the merest subterfuges, void of the true essence of local self-government, with a string attachment by which absolute and despotic power remained in the hands of the Spanish governor-general. Thus it was that in February, 1878, the ten years' revolution was ended by General Campos. Under the stipulations of the treaty the island was allowed to be represented in the Spanish Cortes by 16 senators and 30 deputies; but restrictions were so thrown around their selection that Cubans were practically debarred from participating in the choice of these members, notwithstanding that these so-called representatives were utterly powerless to press any Cuban measure in the Cortes of over 900 members or to put it to a vote.

This military despotism has been accompanied by a system of exorbitant taxation, such as has never been known elsewhere in the world. This has included at times an average of 40 per cent on all imports, in addition to taxes upon real estate, the industries, arts, professions, the slaughtering of meats, and an odious system of stamp taxes, which even included in its far-reaching application the affixing of an impost stamp upon every arrival at a hotel. The processes of possible direct taxation being exhausted, the government even resorted to the establishment of a most nefarious and contaminating lottery system, which yielded a profit of $4,000,000 annually.

In 1879 the total revenue collected was about $35,000,000, or $25 per capita, all of which, except $98,000, was spent—mostly in the payment of the parasitic horde of intransigente soldiers and office-holders and the Spanish debt. In addition to the legal taxation, the commerce is burdened by a system of illegal taxation in the form of bribes, which are necessary to the securing of any legal action. Little or none of this money was devoted to education, science, public construction, harbor improvements, highways, sanitation, or other benevolent purposes, such as those to which our free government devotes its per capita tax of $13.65. It is also a remarkable fact, notwithstanding the extravagant taxation, that only about $100,000,000 have been remitted to the mother country during the past century, most of the revenue having been diverted to maintain the official classes. It is a common assertion that, with the exception of Martinez Campos,

no captain-general has ever returned to Spain after a four years' intendancy except as a millionaire.

Above all the numerous edicts, decrees, customs, and police regulations, the fundamental law of the island is the will of the captain-general, enforced by the following decree of May 28, 1825, which is still in force:

"His Majesty, the King, our Lord, desiring to obviate the inconveniences which might result, in extraordinary cases, from a division of command, and from the interference of powers and prerogatives of the respective officers; for the important end of preserving in that precious island (Cuba) his legitimate sovereign authority and the public tranquillity, through proper means, has resolved in accordance with the opinion of his council of ministers to give to your excellency the fullest authority, bestowing upon you all the powers which by the royal ordinances are granted to the governors of besieged cities. In consequence of this His Majesty gives to your excellency the most ample and unbounded power, not only to send away from the island any persons in office, whatever be their occupation, rank, class, or condition, whose continuance therein your excellency may deem injurious, or whose conduct, public or private, may alarm you, replacing them with persons faithful to His Majesty, and deserving of all the confidence of your excellency; but also to suspend the execution of any order whatsoever, or any general provision made concerning any branch of the administration, as your excellency may think most suitable to the royal service."

Under this law, which has been utilized with terrible effect, misfeasance has developed beyond description and freedom has been a mockery. Year after year the least liberty of thought or expression of opinion or suspicion of liberal ideas on the part of the individual or the press has resulted in imprisonment, death, or deportation. Furthermore, the elsewhere obsolete punishment of torture has added horror to the cruelty of this edict. In 1844 over 3,000 people were executed under this law. During the ten years' war it is estimated that fully 20,000 people suffered its enforcement. The official records show that 4,672 people were executed during the first half of that war. The first act of the Spaniards upon the outbreak of the present revolution was to arrest, imprison, deport, shoot, or otherwise punish every man who was suspected of disloyalty. This class included all who were suspected of liability to become revolutionary sympathizers, such as the leading men of the learned professions—doctors, lawyers, editors, and the faculty of the University—who during the past three years have been imprisoned in the dungeons of Ceuta, Africa, where 730 leading Cuban citizens are now confined, or upon the Isle of Pines. Many

women were similarly treated. This process is still in force, notwithstanding the recent assertion that liberal autonomy has been granted to Cuba. The following extract from the New York *Sun* of April 5, 1898, as I write this article, shows that the force of this despotic decree has not at all been ameliorated by the present farcical autonomous government:

"Many arrests are being made in the city among members of the best families for political causes. Magdalena Peña Redonda, a well-known Cuban lady, was put in jail this morning upon a charge of conspiracy against the government.

"Alfredo Herrera, a young man of an aristocratic family, was arrested this morning in a house in Industria street upon a charge of rebellion. It is said that he was leading a band of insurgents near Habana a few days ago.

"Pablo Larrinago, Juan Romero, Candido Villaneuva, and others, all well known persons, also have been arrested, charged with conspiracy and rebellion."

The right of free speech on the part of the individual citizen has not only been restricted, but the rigorous press law of 1881 requires every editor or manager of a paper to send, duly signed by him, two copies of each issue to government headquarters and two other copies to the district attorney as soon as printed, that it may be seen whether any objectionable remarks are contained therein. Nearly every publication in Cuba has been suspended at some time or other, and its editor fined, imprisoned, or deported to the penal colonies.

The American who undertakes to investigate the history of the Spanish government in Cuba inevitably finds the details too revolting to be described. Greed, injustice, bribery, and cruelty have been practiced with such frequency that volumes could be filled with their horrible details. Above all these, however, stands the fact that Spain has thrice endeavored to wipe out by butchery and starvation the entire native population. The first of these attempts, practiced in former centuries upon the aborigines, was successful. The second attempt was made during the ten years' war by Valamaseda, who wrote:

"Not a single Cuban will remain on this island, because we shoot all those we find in the fields, on their farms, and in every hovel. * * * We do not leave a creature alive where we pass, be it man or animal. If we find cows, we kill them; if horses, ditto; if hogs, ditto; men, women, or children, ditto. As to the houses, we burn them. So every one receives what he deserves—the men with bullets, the animals with the bayonet. The island will remain a desert."

The intentions of this officer were only foiled by the arousal of foreign public sentiment against him, and his replacement by the humane General Campos, who tried to restore peace. The third attempt at extermination, a matter of present history, was made by Weyler, who expressed sentiments as ferocious as those of Valamaseda.

How successfully Weyler's policy has been partially carried out can be answered by the graves of a fourth of the population, which have been recently filled with starved or assassinated victims of his cruelty. Had not this government raised its voice and demanded his recall, the sole remnant of the Cuban people would now have consisted of the soldiers of Gomez.

We have now given in brief the geography, resources, and political conditions of this island. In all history no other country has presented such an unfortunate exhibition of misgovernment. Perhaps ere this article reaches the reader the great government which stands for the highest type of humanity and whose every interest—commercial, hygienic, and strategic—calls for a cessation of Spanish misrule, will have made its influence felt and established a permanent peace upon the island.

Supplemental Note on the Isle of Pines

The principal of the outlying islands considered geographically as a part of Cuba is the Isle of Pines, which is situated about 38 miles south of the coast of Pinar del Rio. This is the only one of the adjacent islands which is not merely an elevated reef or mangrove swamp, and which has a geologic structure and configuration comparable to the mainland. Its area of 1,214 square miles is almost equal to the combined area of the other 1,300 islands and islets.

The island is circular in outline and almost divided by a bayou or salty depression into two divisions, the southernmost of which is a vast cienega or swamp, occupied only by a few fishermen. The main portion of the island is diversified, being dominated by a central ridge of low mountains extending from east to west, rising to 2,000 feet above the sea. Elsewhere the island is quite flat, consisting of land which represents a coralline plain recently reclaimed from the sea.

Steamers from Batabano run to Santa Fé and Nueva Gerona. The latter place is a very small town at the foot of the hills, with

plains of palm trees in its neighborhood, the town itself being on the "Rio de Serra de Casa," some distance from its mouth. Santa Fé, which is the prominent place of resort for travelers, is of itself a miserable congregation of houses on the banks of the river of the same name, some distance from its mouth, and also some distance from the steamboat landing. This landing is a rough wooden wharf, from which carriages and stages ply to Santa Fé. Immediately in the neighborhood of Santa Fé there are beautiful drives and walks some distance back, where the country is more rolling and even hilly.

The climate of the Isle of Pines is delightful, the air is pure, dry, and balmy, and the winds coming from the sea, passing over pine forests, are gentle and invigorating.

The inhabitants of the island are a very simple, kind-hearted set of people and very fond of a chat with strangers. They have a natural dignity of manner, a courteously hospitable way, as also a degree of freshness and innocence.

For many years a large penal colony has been maintained on the island, consisting mostly of Cuban revolutionists.

CAPE MAYCI, EASTERN POINT OF CUBA

Lowest bench, elevated coral reef; Upper terraces, wave-cut cliffs

NOTE.—The date of the landing of Antonio Maceo and the starting of the present revolution, given on page 222 as February 25, 1896, should be February 20, 1895.

THE FLORIDA COAST LINE CANAL

The Florida Coast Line canal, which has been under construction since 1889, is now completed from Mosquito inlet to Miami. Boats of five feet draught traverse semi-weekly the entire distance from Titusville, on the Indian river, through Lake Worth, to Palm Beach. Three short cuts complete the canal—two between Matanzas and Tomoka and one uniting North river with Pablo creek. Eventually the canal will connect the St John river with Biscayne bay, rendering possible an inland passage along the Atlantic coast from Long Island sound to Key West.

THE ORIGIN OF WEST INDIA BIRD-LIFE

By Frank M. Chapman,

American Museum of Natural History, New York

A study of the origin of the life of any given area involves so extensive a knowledge of the factors governing the distribution of life that the ideal theory of the derivation of the fauna of a region should be based on the detailed reports of a corps of specialists, each one of whom should state without bias the *facts* in the case as they have been determined in his particular subject. Thus, before attempting to account for the origin of life in the West India islands, we should receive such reports from the geologist, hydrographer, climatologist, palæontologist, zoölogist, and botanist, and no theory can be satisfactory which does not consider the data presented by these specialists.

Acting on this principle, I offer the following synopsis of studies of West India bird-life made during the past ten years, the detailed results of which will be found in earlier papers :*

My remarks may be prefaced by the statement that. so far as its distribution is concerned, our knowledge of the resident bird-life of the West Indies is essentially complete. Haiti and San Domingo may hold some ornithological secrets, but our recorded information is not likely to receive any material accessions—a condition of affairs for which we have largely to thank Mr C. B. Cory, who has sent collectors to every West India island and published numerous reports on the results of their work.†

Of the 580 or more birds which have now been recorded from the West Indies, no fewer than some 305 are endemic. The remaining 275 are species of general continental or tropical distribution, or those of the surrounding mainland, about 170 being migrants from eastern North America, which occur in the West Indies as winter residents or as transient visitants. Of the 305 endemic species, 293 are land birds, 90 per cent of the resident land birds being therefore endemic—truly a surprising degree of specialization when we consider how near several of the islands

*American Naturalist, 1891, pp. 528–539 ; Bull. Am. Mus. Nat. Hist., iv, 1892, pp. 279–330 ; vi, 1894, pp. 8, 9 ; ix, 1897, pp. 29, 30.

† See his "Birds of the West Indies," in The Auk, iii, 1886, pp. 1–59 *et seq.* ; and "Catalogue of West Indian Birds," published by the Author, Boston, 1892.

are to the mainland. One family (Todidæ) and 38 genera are peculiar. The latter are represented by 96 species, leaving 209 species belonging to genera of North, South, or Central America; but for the most part they have no near mainland allies, and in comparatively few cases can we point with probable exactness to their continental ancestors. In other words, taken as a whole, the endemic birds of the West Indies are widely differentiated from their parent stock.

Considering now the faunal relationships of the islands *inter se*, we find at once that they can be divided into the two groups of physical geographers—the Greater and the Lesser Antilles. With the former belong the Virgin islands and St Croix; with the latter Sombrero, Anguilla, and the other islands east of the Anegada channel and southward to and including Grenada. While some genera (*e. g.*, *Myiadestes* and *Quiscalus*) are represented by more or less closely allied species in both the Greater and Lesser Antilles, and while certain species characteristic of each group (*e. g.*, *Margarops*, *Bellona*, and *Mimocichla spp.*) intrude to some extent into the other, their avifaunæ are quite unlike. The more distinct West Indian species are found only in the Greater Antilles. Thus the Todidæ are represented in each of the larger islands of the Greater Antilles, but are known in the Lesser Antilles. In short, the relationships of the avifauna of these two groups are quite in accord with Mr Agassiz's statement that "the Windward islands were probably raised long after the range of the greater West Indian islands existed * * *"*

Some 108 resident land birds have been found in the Lesser Antilles. Sixteen of these are South American, of which thirteen occur in the Lesser but not in the Greater Antilles, and fourteen are West Indian species, which occur in both the Greater and the Lesser Antilles. Eight genera are peculiar, whereas in the Greater Antilles twenty-four genera are peculiar. These eight genera contain seventeen species upon whose origin we can only speculate. Subtracting them from the eighty-one endemic land birds, we have left sixty-four species, which may be grouped according to their apparent relationships as follows:

Tropical	22
South American	19
West Indian	23

The South American element here shown to be present in the Lesser Antilles at once suggests the possibility of a former land

* Three Cruises of the *Blake*, ii, p. 113, foot-note.

connection between these islands and the continent, and without pausing to inquire into minor questions, let us at once proceed to Grenada, the last island of the group, in order to learn to what extent its avifauna has been influenced by its proximity to the mainland, and especially to the continental island of Trinidad.

Some 195 resident South American land birds are known from Trinidad. Of this number no fewer than sixty-five have been found in Tobago, which was evidently at one time connected with Trinidad, but only sixteen have been recorded from Grenada. In Trinidad these birds represent thirty families, in Tobago twenty-five, and in Grenada but eleven, and these eleven birds, with one or two exceptions, are members of families having wide distribution and extended powers of flight. So far as their avifauna is concerned, therefore, there has apparently been no connection between the Lesser Antilles and the mainland, and we may regard these islands as zoölogical dependencies of both South America and the Greater Antilles, from which, through more or less fortuitous circumstances, their avifauna has been derived.

Turning now to the Greater Antilles, we may at once dispose of the Bahamas as oceanic islands of more recent formation than any of the larger islands or mainland adjacent to them, from which they have evidently received their life. Only one genus is peculiar, and with the exception of its single species, the ancestry of the twenty-five forms peculiar to the Bahamas can be traced with more or less certainty, Cuba furnishing the greater number of parent forms. The Caymans, about 175 miles south of Cuba and 200 miles west of Jamaica, present an apparently similar case, most of the fifteen forms peculiar to them being closely related to Cuban or Jamaican species.

We have left now the four larger islands of the Greater Antilles, from which 174 of the 303 peculiar West Indian birds have been recorded. They are distributed as follows:

Jamaica, 66, of which 42 are endemic; Cuba, 68, of which 45 are endemic; Haiti and San Domingo, 56, of which 34 are endemic; Porto Rico, 46, of which 25 are endemic.

As I remarked in the paper on the "Origin of West Indian Bird-life," previously referred to: "It will be observed that although Jamaica is but little larger than Porto Rico, and is more isolated from neighboring regions than any island of the group, it is nearly as rich in endemic species, and has one

more peculiar genus than Cuba. The latter island is not only ten times as large as Jamaica, but its proximity to Florida has given it at least four forms which have evidently been derived from Florida species. * * * Haiti and San Domingo, although about seven times as large as Jamaica, have eight endemic species less, while Porto Rico, nearly as large as Jamaica and favorably situated for the reception of Lesser Antillean species, has seventeen endemic species less than Jamaica, and but one genus is peculiar to the island.

"It is evident that, as Wallace has said, the islands 'were not peopled by immigration from surrounding countries while in the condition we now see them, for in that case the smaller and more remote islands would be very much poorer, while Cuba, which is not only the largest, but nearest to the mainland in two directions, would be immensely richer, just as it really is in migratory birds.'" (Distrib. Animals, Am. ed., II, 1876, p. 66.)

These facts in distribution and a study of hydrographic charts give us some suggestive evidence in regard to a past land connection between the West Indies and the mainland. Thus we discover that an elevation of only 100 fathoms would leave but two channels, the wider 75 miles across, between Jamaica and the Honduras coast. Wallace, in theory, completely bridged this gap, connected Cuba with Yucatan, and filled the sea thus enclosed with land, to which Sclater gave the name "Præantillesia;" but, as Mr Agassiz has remarked: "The deep soundings (over 3,000 fathoms) developed by the *Blake* south of Cuba, between that island and Yucatan and Jamaica, do not lend much support to the theory of an Antillean continent as mapped out by Wallace, nor is it probable that this continent had a much greater extension in former times than now, judging from the depths found on both sides of the West Indian Islands" (l. c., p, 116).

While the disproportionately rich avifauna of Jamaica and the shallow sea between this island and the mainland suggests the possibility of a continental land connection at this point, the absence of representatives of certain families of birds from the Greater Antilles is opposed to the theory of this connection ever having been complete. Thus, with the exception of *Hadrostomus niger* in Jamaica and *Colinus virginianus cubanensis* in Cuba, the following twelve families of Mexican and Central American birds are without representatives in the Greater Antilles: Troglodytidæ, Pipridæ, Cotingidæ, Dendrocolaptidæ, Formicariidæ, Galbulidæ,

Bucconidæ, Momotidæ, Rhamphastidæ, Cracidæ, Tetraonidæ, Tinamidæ.

In his list of the birds of Costa Rica, Zeledon records no less than 140 species of birds belonging to these families, and their non-representation in the West Indies is a fact which cannot be ignored. Especially does their absence become significant when we consider that with few exceptions they are birds of terrestrial or sedentary habits, which we should not therefore expect to find on oceanic islands.

Although in previous papers I have proceeded to theorize on the facts here presented, I shall on this occasion adhere to the suggestion made in my opening sentence, and with this presentation of the more important results derived from a study of West India bird-life, leave the larger questions involved until we are in possession of the reports of other specialists.

TRADE OF THE UNITED STATES WITH CUBA

The trade of the United States with Cuba reached its high-water mark in 1892–'93, when it amounted to $102,864,204, the ratio of imports to exports being approximately as 10 to 3.

This total was almost equal to that of our entire Asiatic trade, was nearly four times that of our trade with China or Japan, and thirteen times that of our trade with Russia, while it even exceeded the grand total of that with Austria-Hungary, Russia, Sweden and Norway, Denmark, Turkey. Greece, Italy, Switzerland, and Portugal combined. Nor does this contrast derive its strength mainly from the largeness of the imports. The exports themselves, products of our own country, were nearly twice as great in point of value as our exports to Italy, over three times as great as those to China and Japan combined, nearly six times as great as those to Sweden and Norway, and over ten times as great as those to Russia; they amounted to almost half as much again as our total exports to Asia, and even exceeded our total exports to South America, exclusive of Brazil.

So much for the aggregate. What of the different items of which it is composed? These may best be considered in detail if presented in tabular form, and the accompanying tables will accordingly show the principal imports into the United States from Cuba and the principal exports of domestic merchandise

Values of domestic merchandise exported from the United States to Cuba during the ten years ending June 30, 1897

Articles.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Animals, live	$8,778	$14,264	$12,820	$42,631	$25,513	$20,411	$42,508	$24,163	$121,881	$433,089
Animal products	2,691,567	3,301,509	2,957,126	2,840,649	4,289,306	5,718,101	5,176,314	3,270,497	2,470,505	2,429,113
Breadstuffs	1,387,752	1,336,047	1,520,617	874,979	2,305,031	3,512,207	3,164,541	1,569,008	774,792	888,123
Coal and coke	460,584	581,094	722,856	776,526	1,041,751	931,571	918,528	1,103,765	626,935	639,427
Cotton, and manufactures of	112,281	126,180	140,318	102,173	114,112	148,670	120,183	67,441	63,834	67,452
Chemicals, dyestuffs, etc	219,389	249,710	277,171	259,028	387,377	286,562	291,916	272,269	197,054	195,950
Hay and straw	29,161	31,675	20,853	24,585	45,395	54,791	87,700	43,869	85,652	49,728
Iron and steel, and manufactures of	1,257,423	1,988,018	2,709,904	3,120,276	4,410,798	6,691,929	4,696,327	2,476,779	769,356	426,173
Manufactures	582,003	712,854	948,740	836,180	1,090,449	1,431,849	1,146,480	855,079	361,254	334,572
Manufactured products	322,039	457,355	567,235	581,782	546,394	329,525	297,325	133,164	110,205	94,404
Provisions, other than B. S. or A. P	491,746	523,661	441,130	410,011	757,768	1,315,097	1,052,767	651,357	494,940	873,407
Oils	432,620	410,203	601,716	384,121	511,749	548,092	556,139	510,356	354,838	312,526
Paper, and manufactures of	226,600	245,078	321,589	202,124	210,509	198,970	192,503	147,329	88,909	272,551
Wood, and manufactures of	1,320,536	1,111,002	1,208,733	1,191,676	1,528,983	1,881,095	1,571,297	770,064	490,396	412,651
All other	181,645	208,548	218,701	282,864	387,276	526,224	540,709	638,120	301,797	170,591
Total domestic exports	9,724,124	11,297,198	12,669,509	11,929,605	17,622,411	23,604,094	19,855,237	12,533,260	7,312,348	7,599,757

Values of merchandise imported into the United States from Cuba during the ten years ending June 30, 1897

Articles.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Animal products	$238,687	$308,697	$338,236	$439,807	$279,282	$292,305	$187,038	$77,484	$184,281	$872,392
Chemicals	17,201	36,700	51,830	372,212	276,211	383,786	141,349	81,424	32,312	13,122
Wines, spirits, etc	44,969	45,780	45,100	54,586	53,864	43,022	20,131	(*)	(*)	16,247
Manufactured products	94,620	79,830	105,289	113,025	12,495	672,370	208,321	(*)	(*)	29,412
Ores, metals, and manufactures of	326,162	588,245	619,201	932,670	723,279	34,527	11,827	294,908	521,310	658,605
Fruit, vegetables, etc	1,519,408	1,649,633	1,852,997	1,805,250	2,264,056	2,464,191	1,985,715	989,738	1,070,490	354,590
Sugar, molasses, etc	38,680,821	39,644,362	39,099,802	46,830,047	62,642,686	61,718,722	64,296,266	40,872,497	24,231,309	11,995,179
Tobacco	7,941,516	9,261,441	11,088,240	10,484,604	10,802,690	11,727,088	7,881,468	9,311,980	12,707,352	4,277,281
Wood, and manufactures of	399,427	432,187	528,929	585,485	530,398	1,074,310	684,488	640,774	531,349	67,333
All other	56,276	83,748	71,967	96,709	346,710	296,185	261,658	602,454	739,327	122,654
Total imports	49,319,087	52,130,623	53,801,591	61,714,395	77,931,671	78,706,506	75,678,261	52,871,259	40,017,730	18,406,815

* Included in other classifications.

from the United States to that island for the ten years ending June 30, 1897.

The principal article imported is sugar, the largest importation of which was in the fiscal year 1893–'94, when it amounted to 949,778 tons of 2,240 pounds, or over one million tons of 2,000 pounds. This was equivalent to 30 pounds or more per capita of our population, and constituted about one-half of our total consumption. The next item in importance is tobacco, the imports of which reached their highest figures in 1895–'96, when they amounted in point of value to considerably more than one-third of the total value of our own tobacco crop. The only other class of imports that calls for special mention consists of fruit and vegetables, which had a value in 1892–'93 of nearly two and one-half million dollars.

The principal articles of export are, as will be seen from the table, meats, breadstuffs, and manufactured goods, the trade in all of which articles was rapidly assuming very large dimensions at the outbreak of the insurrection. Coal, coke, and oils were also exported in considerable quantities; indeed, so diversified were our exports that there is no considerable section of the entire country that was not to a greater or less degree benefited by the market for our agricultural, mineral, and manufactured products that existed in Cuba.

Between 1893–'94 and 1896–'97, however, our imports from Cuba suffered a decline of 75.7 per cent, and our exports to the island a decline of 61.7 per cent, the imports being reduced to less than one-fourth and the exports to little more than one-third of their previous volume. During the first year of the insurrection our trade fell off over thirty million dollars, during the second year a further sum of eighteen million dollars, and during the third year a still further sum of twenty-one million dollars, making a total decline of sixty-nine million dollars in the annual value of our foreign trade, and of a branch of it, moreover, that is carried almost entirely in American bottoms.

Is it any wonder that, entirely aside from the humanitarian considerations that have prompted the United States government to seek to put an end to the unfortunate conditions so long prevailing in the island, some justification for such intervention should have been found in the well-nigh total paralysis of our commercial relations with that once extensive and profitable market?

J. H.

CAPTAIN CHARLES D. SIGSBEE, U. S. N.

Captain Charles Dwight Sigsbee, U. S. N., whose portrait forms the frontispiece of this number of the magazine, was born July 16, 1845, in New York. He graduated from the Naval Academy in 1863 and served throughout the Civil War; was on board the *Monongahela* at the battle of Mobile bay, and in the Fort Fisher fights. In 1868 he was made a Lieutenant-Commander. In 1874 he was placed in command of the *Blake*, and during the succeeding four years was engaged in deep sea exploration in the Gulf of Mexico and the Gulf of Maine. During part of this time Prof. Alexander Agassiz was upon the *Blake* directing the deep-sea dredgings.

Almost immediately after taking command of the *Blake*, Sigsbee instituted improvements in instruments for deep-sea sounding, and virtually designed a new machine for that purpose, which has since been adopted all over the world. The results of the deep-sea soundings made by the *Blake* under his command were published as an appendix to the report of the U. S. Coast and Geodetic Survey for 1880, under the title "Deep Sea Sounding and Dredging. A Description and Discussion of the Methods and Appliances used on board the Coast and Geodetic Survey Steamer *Blake*." This work has proved valuable in many ways, especially with reference to the intricate problems involved in the study of the Gulf stream. The report is a comprehensive and standard treatise on deep-sea exploration.

For several years prior to taking command of the *Maine* Captain Sigsbee was Hydrographer of the Navy Department. While thus in charge of the Hydrographic Office he developed many improvements tending to simplify and strengthen the data and material furnished the marine from both the practical and scientific sides. During his detail in charge of the Hydrographic Office Captain Sigsbee was a member of the U. S. Board on Geographic Names.

Captain Sigsbee's contributions to our knowledge of the sea bottom and its topography place him in the front rank of scientific hydrographers. As a naval officer and an American the events of the past two months have shown what manner of man he is.

H. G.

RECEPTION TO CAPTAIN C. D. SIGSBEE, U. S. N.

Not only has the name of Captain Charles D. Sigsbee become a household word throughout the length and breadth of the United States as that of the gallant commander of the ill-fated battleship *Maine*, but Captain Sigsbee himself, by the admirable self-restraint and judicial temper which he displayed in the most trying of all conceivable circumstances, has won "golden opinions from all sorts of people." In addition, however, to being a brave officer, a true patriot, and a just man, he has distinguished himself, as shown in the preceding article, by his valuable contributions to hydrographic science, so much so, indeed, that his position in the scientific circles of the National Capital is as well recognized and assured as his standing as a naval officer.

It was eminently fitting, therefore, that the National Geographic Society, of which Captain Sigsbee has long been an active member, should take advantage of his recent return to Washington to do him honor. Immediately on his arrival the following letter was addressed to him by President Alexander Graham Bell:

WASHINGTON, D. C., *March 30, 1898.*

Captain CHARLES D. SIGSBEE, U. S. N., *Washington, D. C.*

MY DEAR SIR: You have earned the gratitude of America by your noble conduct in a great and terrible emergency, when your prompt, energetic, and wise action held in check the popular excitement which threatened to precipitate war between friendly nations.

The citizens of Washington are, one and all, anxious to greet the brave Commander of the *Maine*.

Your fellow-members of the National Geographic Society especially, to whom you have so long been known as a scientific hydrographer, desire to grasp you by the hand and welcome you back to the city once more.

On behalf of the National Geographic Society, allow me to tender you a reception, to be held in the parlors of the Arlington Hotel on Saturday evening, April second, from nine to eleven o'clock.

I am, my dear sir, yours respectfully,

ALEXANDER GRAHAM BELL,
President National Geographic Society.

To this invitation Captain Sigsbee responded as follows:

WASHINGTON, D. C., *March 30, 1898.*

Professor ALEXANDER GRAHAM BELL,
President National Geographic Society, Washington, D. C.

MY DEAR SIR: In acknowledging the receipt of your letter of today, wherein the members of the National Geographic Society tender me a

reception on Saturday to meet my associates of the Society as well as other residents of Washington, I beg to thank you sincerely for the kind sentiments which you express. The honor which the Society proposes for me I accept most gratefully, not alone for the good will towards myself, but also because the occasion will reflect honor on those who served with me on board the *Maine* at Havana.

To come out of so great a disaster with honor and to have the fact confirmed in so positive a manner is a satisfaction that lies nearest the heart of every survivor of the *Maine*.

With full appreciation of your offer, which please express to the Society, I am,

Yours most sincerely and most respectfully,

C. D. SIGSBEE,
Captain, U. S. Navy.

Three days later—namely, on the evening of Saturday, April 2—the parlors of the Arlington Hotel were crowded with one of the most brilliant and distinguished assemblages ever brought together in the National Capital, the President of the United States, the Vice-President and Mrs Hobart, and an exceptionally large gathering of statesmen, diplomatists, scientists, military and naval officers of high rank, and other distinguished persons to the number of 1,600 uniting to do honor to the Society's guest, to whom each of them was presented by President Bell.

Rarely has a purely scientific society performed a function so entirely *en rapport* with public sentiment and been so truly "national" in any of its doings. Everything conspired to give a national character to the occasion. In addition to the attendance of the Chief Magistrate of the Nation and of a gathering in which few states of the Union and few departments of the national life were not specially represented, a guard of honor was furnished by the U. S. Marine Corps, whose band, stationed in the ball-room, performed a selection of patriotic music, under special orders from the Secretary of the Navy, while the brilliant salons set apart for the occasion were decorated with the handsomest national flags and emblems the resources of the government could furnish.

J. H.

GEOGRAPHIC LITERATURE

Rand-McNally War Atlas, with Marginal Index. Pp. 16. Chicago and New York: Rand, McNally & Co. 1898. 25 cents.

Bulletin of the Department of Labor. No. 16. May, 1898. Pp. 216. Washington, 1898.

Statistical Abstract of the United States. 1897. Twentieth Number. Prepared by the Bureau of Statistics, Treasury Department. Pp. xii + 412. Washington, 1898.

It was surely a happy thought on the part of Rand, McNally & Co. to select from one of their high-priced atlases a series of maps of those portions of the world to which public attention is being directed in connection with the war with Spain, and to place them within the reach of every one by binding them up together for sale at 25 cents. The atlas is everything that can be desired, in its way. It is marvelously cheap, and cannot fail to have an enormous sale.

The May bulletin of the Department of Labor is largely devoted to a report on The Alaskan Gold Fields and the Opportunities they offer for Capital and Labor, by Mr Sam. C. Dunham, a special agent who was sent out to the Klondike by the Commissioner of Labor in July last. The report is accompanied by maps and illustrations and contains much valuable information. While written in a becomingly dignified style, it is occasionally enlivened by a vein of quiet humor, which adds greatly to its readability. Good examples of this are found in the statement: "If a visitor to the gulches prefers to ride, he can secure a saddle-horse in Dawson for $60 a day," and in the author's description of the proceedings of the improvised courts, the creation of a justice-loving community that has no regularly constituted judicial system or officers of the law.

As a compendium of information relative to the population, finance, commerce, agriculture, mining, railroads and telegraphs, immigration, education, public lands, pensions, postal service, prices of commodities, shipping, etc., of the United States, the Statistical Abstract has become an absolute necessity, not only to all economic writers and students, but to every one who would keep abreast of the growth of our institutions and the development of our resources as a nation. The Abstract has been almost completely transformed under the direction of Mr Worthington C. Ford, and it is not easy to see how it could be made more useful, except by increasing its circulation.

J. H.

Ninth Annual Report on the Statistics of Railways in the United States for the year ending June 30, 1896. Prepared by the Statistician to the Interstate Commerce Commission. Pp. 709 and map. Washington, 1897.

This report follows the same general plan and presents the same technical excellence that have rendered all the reports prepared by Prof. Henry C.

Adams as Statistician to the Interstate Commerce Commission especially acceptable to all trained statisticians.

The condition of the railway system of the United States on June 30, 1896, and during the twelve months ending with that date, was about as follows The aggregate growth of the railways was 182,776.63 miles, of which 181,153.77 miles were represented by reports to the Commission. There were 10,685.16 miles of second track, 990.45 of third track, 764.15 of fourth track, and 44,717.73 of yard track and sidings, making the total mileage of all tracks 239,140.13. The railway construction during the period covered was slightly greater than during the fiscal year 1895, but less than during any other year covered by the statistical reports of the Commission.

Forty-four corporations operated 103,345.89 miles, or 56.89 per cent of the railway mileage of the country, the remainder being operated by 1,067 companies, of which 977 operated but 34,497.90, or 18.99 per cent of the total. Equipment consisted of 9,943 passenger locomotives, 20,351 freight locomotives, 5,656 switching and other locomotives, 33,003 passenger cars, 1,221,887 freight cars, and 42,759 cars employed in companies' service. The passenger service performed was equal to carrying 1,312,381 passengers one mile for each passenger locomotive, and 4,684,210 tons of freight one mile per freight locomotive, both of these items showing a gratifying increase in efficiency over the previous year. The resources of the Commission do not permit of the collection of statistics of cars owned by private companies. The number of employés was 826,620, having increased since June 30, 1895, from 785,034, but being less than the number employed on June 30, 1893. The number assigned to general administration was 31,792, to maintenance of way and structures 243,627, to maintenance of equipment 167,850, and to conducting transportation 373,747, the balance of 9,609 being unclassified. The average daily compensation of general officers was $9.19; of station agents, $1.73; of engineers, $3.65; of firemen, $2.06; of conductors, $3.05; of section foremen, $1.70; of other trackmen, $1.17, and of switchmen, flagmen, and watchmen, $1.74. The total amount paid as compensation for labor was $468,824,531, amounting to 61 per cent of the entire expense of operation, less than 2¾ per cent of the amount being paid to general officers. The total railway capitalization is reported as $10,566,865,771, and the average per mile of line as $59,610. These figures are not comparable with those of previous years for the reason that, at the request of the Association of American Railway Accounting Officers, the continuous coöperation of which with the Statistician has been a source of considerable advantage, "other forms of indebtedness," which in 1895 constituted $616,830,156, or $3,556 per mile of line of the capital reported, is no longer included. It is especially notable as a result of the railway financiering incident to the rehabilitation of those companies which have become bankrupt during the recent depression, that the increase in capital stock during the last two years has for the first time since the establishment of the Commission exceeded the increase in funded debt. As success in securing a definite aggregate profit upon capital stock is not essential, this change makes for permanent financial stability. Another transformation of capital tending in

the same direction is shown by the fact that an increase in income bonds has been accompanied by an absolute decrease in the amount of mortgage bonds.

It is interesting also to observe that of the total stocks and bonds outstanding those having a par value of $1,501,346,914 are held by railway corporations. Of the total stock outstanding an amount having a par value of $3,667,503,194, or 70.17 per cent, paid no dividends, while $515,029,668, or 11.40 per cent, of bonds was similarly unremunerative to investors. The percentage of income bonds not receiving interest was 87.96. The total amount paid in dividends on common and preferred stock was $87,603,371, as interest on funded debt $249,624,177, and as interest on current liabilities $8,469,063. The public service performed was equivalent to carrying 13,049,007,233 passengers and 95,328,360,278 tons of freight one mile. Passenger service showed an increase over the preceding year, but was lower than that of 1894, 1893, and 1892. The freight service performed exceeded by more than ten billion ton miles that of the preceding year and exceeded that of 1893, the highest year previously recorded.

The total earnings from operation were $1,150,169,376, of which $266,562,533 was from passengers, $63,951,481 from mail, express, and other miscellaneous sources connected with passenger service, $786,615,837 from freight, $3,885,890 from miscellaneous sources connected with freight service, and $29,153,635 unclassified, or from other operations. The average revenue per passenger per mile was 2.019 cents, and that per ton of freight per mile .806 cent, the latter being lower than for any previous year covered by the reports of the Commission. Operating expenses amounted to $772,989,044, or 67.21 per cent of the total income from operation. The average cost of running a train one mile was 93.838 cents. From the summary of accidents it appears that 181 passengers, 1,861 employés, and 4,406 "other persons" were killed during the year covered by the report, while 2,873 passengers, 29,969 employés, and 5,840 "other persons" were more or less seriously injured. Comparing these data with the number of passengers and of employés, it appears that one passenger in every 2,827,474 carried was killed, and one in every 178,132 carried was injured, while one employé in every 444 was killed and one in every 28 injured. Of the "other persons" killed, 3,811 were trespassers, and of those injured, 4,468. The statistics of accidents to that class of employés whose duties involve their presence on running trains are particularly disheartening. They show that during the twelve months covered by the report one in every 152 of such employés was killed, and one in every 10 more or less seriously injured. The increased use of safety appliances does not seem materially to have affected this ratio, and it is to be doubted whether it will do so until all cars are properly equipped. Of the 1,333,599 cars in service, 448,854 were equipped with train brakes, the increase during the twelve months covered by the report being 86,356, while the actual increase in the number of cars was 27,339. The number equipped with automatic couplers was 545,583, being an increase during the year of 136,727; 9,816 of the 9,943 passenger locomotives in service

were fitted with train brakes, as were also 17,921 of the 20,351 freight locomotives, and 3,895 of the 5,656 switching and other locomotives.

Such is the picture of the condition of the railways of the United States so far as it can be derived from this report, and if it fails to meet in any way with the reasonable desires of the student of transportation who seeks a complete numerical description of the business of interstate transportation of persons and property as conducted in the United States at the present time, the fault is in no way attributable to the statistician or to his assistants, but to the inadequacy of the legislation which provides for the collection of these statistics. The very excellence of the report from a technical standpoint causes greater regret that those who have had its preparation in charge have not been intrusted with the collection of those data which all intelligent students of transportation so seriously need. No statistical report can adequately present the business of transportation while omitting to deal with the business of express compani s and that of interstate carriers operating via water routes. It is also to be desired that the classification of the data now collected be greatly extended and the supervision of the accounting of individual roads so perfected as to insure greater definiteness in the items included.

H. T. NEWCOMB.

GEOGRAPHIC SERIALS

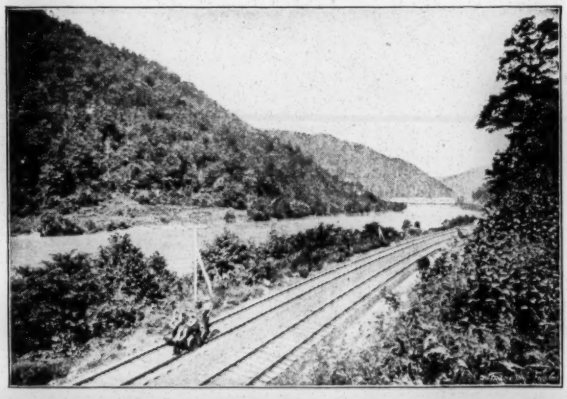
The Geographical Journal for March contains a summary of Mr Peary's explorations in Greenland, under the title of "Journeys in North Greenland." Dr Sven Hedin commences a narrative of his "Four Years' Travel in Central Asia." Hon. D. W. Carnegie publishes a narrative of his "Explorations in the Interior of Western Australia."

The *Bulletin of the American Geographical Society*, No. 1, 1898, offers the following table of contents: "Relations of Irrigation to Geography," by H. M. Wilson; "From Cairo to Beni Hassan," the location of some of the most celebrated tombs of ancient Egypt, by D. Cady Eaton, and "Physical Geography of New York State," the third installment of a continued story, by Prof. R. S. Tarr.

The *Journal of the Royal Colonial Institute* for March is largely devoted to a paper by Henry Birchenough on "Some Aspects of our Imperial Trade," and an extended discussion. It is curious to find an Englishman complaining of the greater cheapness of foreign goods, of the want of adaptability of British manufacturers and traders, the superiority of foreign methods of pushing trade, and the lower freights of foreign shipping companies, especially when he instances the American as the chief competitor and as excelling the Briton in these respects. The article is extremely significant and very suggestive. Another suggestive article is by Mr Everard R. Calthrop on "Light Railways for the Colonies," in which he rehearses arguments in favor of cheap construction which, while perhaps new to his readers, have controlled the construction of the entire railroad system of this country.

H. G.

C&O ROUTE



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H. W. FULLER, *Genl. Pass. Agent, Washington, D. C.*

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